Supreme Court, U.S.
FILED
98 657 OCT 21 1998
OFFICE OF THE CLERK

No. -

In the Supreme Court of the United States

OCTOBER TERM, 1998

STATE STREET BANK AND TRUST COMPANY,
PETITIONER,
v.
SIGNATURE FINANCIAL GROUP, INC.,
RESPONDENT.

ON A PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

PETITION FOR A WRIT OF CERTIORARI

WILLIAM L. PATTON
Counsel of Record
JAMES L. SIGEL
JAMES S. DEGRAW
MARK D. MEREDITH
ROPES & GRAY
One International Place
Boston, MA 02110
(617) 951-7000
and
MAURICE E. GAUTHIER
WILLIAM E. HILTON
SAMUELS, GAUTHIER & STEVENS
225 Franklin Street
Boston, MA 02110
(617) 426-9180
Counsel for Petitioner

October 21, 1998

Blanchard Press, Inc., Boston, Mass — Law Printers (617) 426-6660

62 pp

Question Presented

Whether the computer application of a mathematical algorithm to produce a useful result, without more, is sufficient to satisfy the patentable subject matter requirements of 35 U.S.C. § 101.

Rule 29.6 Listing

Pursuant to Rule 29.6 of the Rules of the Supreme Court of the United States, State Street Bank and Trust Company states that it has one parent, State Street Corporation, and that, as to nonwholly owned subsidiaries, State Street has a sixty percent interest in Advanced Investment Technology, Inc., and through a wholly owned subsidiary, it has a seventy-five percent interest in King Street Advisors, Ltd., a fifty percent interest in European Financial Data Services, Ltd., and a fifty percent interest in State Street Mansion House Investment Management Services, Ltd.

TABLE OF CONTENTS

	Page
Question Presented	i
Rule 29.6 Listing	ii
Table of Authorities	iv
Opinions Below	1
Jurisdiction	2
Constitutional and Statutory Provisions Involved	2
Statement of the Case	2
Reasons for Granting the Writ	5
Conclusion	11
Appendix	
Federal Circuit Opinion	A-1
Memorandum and Order of District Court	A-18
Federal Circuit Order	A-45

TABLE OF AUTHORITIES

Cases

	Page
In re Alappat, 33 F.3d 1526 (Fed. Cir. 1994)	3, 5
Diamond v. *Chakrabarty*, 447 U.S. 303 (1980)	5-6, 8, 10
Diamond v. *Diehr*, 450 U.S. 175 (1981)	5-6, 8, 9-10
Gottschalk v. *Benson*, 409 U.S. 63 (1972)	5-6, 7, 8-9, 10
Graham v. *John Deere Co.*, 383 U.S. 1, (1967)	10-11
Hughes Aircraft Co. v. *U.S.*, 148 F.3d 1384 (Fed. Cir. 1998)	7
In re Johnson, 589 F.2d 1070 (C.C.P.A. 1979)	7
Parker v. *Flook*, 437 U.S. 584 (1978)	5-6, 8, 9, 10, 11
In re Richman, 563 F.2d 1026 (C.C.P.A. 1977)	9
In re Walter, 618 F.2d 758 (C.C.P.A. 1980)	7

Statutes and Regulations

26 C.F.R. 1.704-1	4
28 U.S.C. § 1254(1)	2
35 U.S.C. § 101	2-3, 5, 6-7, 8-10
35 U.S.C. § 102	7
35 U.S.C. § 103	7
61 Fed. Reg. 7478 (Feb. 28, 1996)	5

Miscellaneous

Page

Teresa Riordan, *Patents; An appeals court says a mathematical formula can be patented, if it is a money-maker*, New York Times, August 3, 1998, at D2, Col. 4 6

Scott Thurm, *Online: A Flood of Web Patents Stirs Dispute Over Tactics*, Wall Street Journal, October 9, 1998, at B1, Col. 3 6

Robert C. Scheinfeld & Parker H. Bagley, *State Street: Virtually Anything is Patentable*, New York Law Journal, September 23, 1998, at 3 6

In the
Supreme Court of the United States

OCTOBER TERM, 1998

No. -

STATE STREET BANK AND TRUST COMPANY,
PETITIONER,

v.

SIGNATURE FINANCIAL GROUP, INC.,
RESPONDENT.

ON A PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

PETITION FOR A WRIT OF CERTIORARI

The petitioner State Street Bank and Trust Company ("State Street") respectfully prays that a writ of certiorari issue to review the judgment and opinion of the United States Court of Appeals for the Federal Circuit, entered on July 23, 1998.

Opinions Below

The opinion of the United States Court of Appeals for the Federal Circuit is reported at 149 F.3d 1368, 47 U.S.P.Q.2d 1596 (Fed. Cir. 1998), and is reprinted in the Appendix hereto, p. A-1, *infra*.

The Memorandum and Order of United States District Court for the District of Massachusetts (SARIS, D.J.) is reported at 927 F. Supp. 502, 38 U.S.P.Q.2d 1530 (D. Mass. 1996) and is reprinted in the Appendix hereto, p. A-18, *infra*.

Jurisdiction

The judgment for the United States Court of Appeals for the Federal Circuit was entered on July 23, 1998. The Supreme Court has jurisdiction pursuant to 28 U.S.C. § 1254(1).

Constitutional and Statutory Provisions Involved

Article I, Section 8, clause 8, of the Constitution of the United States provides:

> The Congress shall have Power . . .
>
> . . . .
>
> To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries. . . .

35 U.S.C. § 101 provides:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Statement of the Case

This case arises out of a declaratory judgment action brought by petitioner in the United States District Court for the District of Massachusetts seeking to invalidate a patent for a computerized accounting system capable of managing mutual fund investment structures. Faced with a claimed invention that involves nothing more than the inputting, calculating, outputting and storing of numbers for a partnership accounting system, the District Court properly declared

United States Patent No. 5,193,056 (the "'056 patent") invalid under 35 U.S.C. § 101 for lack of patentable subject matter and granted State Street summary judgment. In doing so, the District Court carefully examined the claims and specification of the patent in light of the pertinent law.

In its review of this case, the Federal Circuit pronounced a new and sweepingly broad rule of sufficiency for subject matter patentability of algorithms: That Court required only that *"to be patentable [subject matter] an algorithm must be applied in a 'useful' way."* 149 F.3d at 1373, 47 U.S.P.Q.2d at 1601 (emphasis added). Accordingly, since any algorithm with even the most minimal commercial significance passes muster under this utility test, the Federal Circuit reversed and remanded this case to the District Court, holding that the computerized calculation of data "... into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces 'a useful, concrete and tangible result....'" 149 F.3d at 1373, 47 U.S.P.Q.2d at 1601 (quoting *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994) (en banc)).

The subject matter of this case is not complex. The invention claimed is a data processing system based on a software accounting program. The particular invention claimed in the '056 patent is related to a multi-tiered or, in Signature Financial Group, Inc.'s ("Signature") words, "Hub and Spoke" financial services configuration.

> In essence, a Hub and Spoke arrangement is an investment structure whereby mutual funds ("Spokes") pool their assets in an investment portfolio ("Hub") organized as a partnership. "This financial services configuration involves an entity that is *treated as a partnership for federal income tax purposes* and that holds the investment portfolio ... and funds that invest as partners in the partnership portfolio." '056 Patent, col. 1.

927 F. Supp. at 504, 38 U.S.P.Q.2d at 1532-33 (emphasis added).[1] The claimed invention of the '056 patent is not the Hub and Spoke concept *per se*, that is, it is not the concept of having mutual funds pool assets like a partnership. Rather, it pertains to a data processing system for this type of investment structure that

> calculates and stores data representing: the percentage share that each Spoke fund holds in the Hub portfolio; any daily activity affecting the portfolio's assets; allocations of gains, losses and expenses to each of the Spoke member funds; and tracking and updating data that are used to determine aggregate year-end income, gains, losses, and expenses for accounting and tax purposes.

927 F. Supp. at 505, 38 U.S.P.Q.2d at 1533.

The only specific structure described in the '056 patent's specification corresponding to any of the claim's means is a personal computer programmed with software that is capable of storing data on a floppy disk. 927 F. Supp. at 505-06, 38 U.S.P.Q.2d at 1533 (citing '056 patent, col. 6). Any computer will do.

The District Court's analysis led to an inevitable conclusion: The '056 patent fails to claim any patentable subject matter. The reason why was and is plain: "Quite simply, [the '056 patent] involves no further physical transformation or reduction than inputting numbers, calculating numbers, outputting numbers, and storing numbers." 927 F. Supp. at 515, 38 U.S.P.Q.2d at 1541. Following appropriate precedent and principles, the District Court correctly concluded that regardless of the presence or absence of computers, manipulating and recording numbers is insufficient to make the subject matter patentable.

---

[1] The italicized language highlights the fact that in this mutual fund context the patent's claims are so broad that any computerized system that is designed to carry out the accounting functions called for by the applicable Internal Revenue Service Regulations (generally, 26 CFR 1.704-1) would infringe the patent.

In its Memorandum and Order, the District Court analyzed the '056 patent under various perspectives the law provides for considering whether claimed inventions like Signature's are directed to patentable subject matter. This included a review of 1) this Court's decisions in *Gottschalk* v. *Benson*, 409 U.S. 63 (1972); *Parker* v. *Flook*, 437 U.S. 584 (1978); and *Diamond* v. *Diehr*, 450 U.S. 175 (1981); 2) applicable Federal Circuit precedent; 3) the PTO Examination Guidelines for Computer-Related Inventions, 61 Fed. Reg. 7478 (Feb. 28, 1996) ("Guidelines"); and 4) the business methods exceptions to § 101. *See* 927 F. Supp. at 508-16, 38 U.S.P.Q.2d at 1535-42.

Under each perspective, the District Court reached the same conclusion: As a whole, the '056 patent claims nothing directed to patentable subject matter. Rather, "like other accounting methods, it is designed to manipulate and record numbers," and thus is nothing more than an unpatentable abstract idea. 927 F. Supp. at 514, 38 U.S.P.Q.2d at 1541.

In writing for the Federal Circuit, Judge Rich rejected the District Court's rationale and found that "[t]he question of whether a claim encompasses statutory subject matter should ... focus ... on the essential characteristics of the subject matter, in particular, its practical utility." 149 F.3d at 1375, 47 U.S.P.Q.2d at 1602. That is, the touchstone of patentable subject matter under § 101 is now, according to the Federal Circuit, whether, *without more*, the claimed invention "produces a 'useful, concrete and tangible result.'" *Id.* (quoting *Alappat*, 33 F.3d at 1544).

Subsequent to the issuance of its opinion in this case, the Federal Circuit granted State Street's motion for a stay of mandate pending the filing of this Petition for Certiorari. App. A-45.

Reasons for Granting the Writ

The decision of the Federal Circuit directly conflicts with the principles of this Court's holdings in *Gottschalk* v. *Benson*, 409 U.S. 63 (1972), *Parker* v. *Flook*, 437 U.S. 584 (1978),

Diamond v. *Diehr*, 450 U.S. 175 (1981), and *Diamond* v. *Chakrabarty*, 447 U.S. 303 (1980). Indeed, the opinion of the Federal Circuit has effectively overruled binding decisions of this Court and adopted an interpretation of Section 101 of the Patent Act that is contrary to the understanding that has prevailed since the origin of the statute.

The question presented is of significant national importance. Since *every* computerized numerical manipulation that has any possibility of commercial significance produces a "useful, concrete and tangible result," the practical consequences of the Federal Circuit's decision are of an unprecedentedly broad scope. The patentability of mathematical formulae or algorithms has fundamental implications for all aspects of economic life. These implications extend to manufacturers and consumers, to companies as well as individuals. The decision of the Federal Circuit has created confusion and imposed costs in areas that heretofore have flourished without the burdens of the patent system.[2]

1. Section 101 of Title 35 reads:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

---

[2] The ramifications of the Federal Circuit's decision for the business community have been the subject of considerable commentary. See, *e.g.*, Teresa Riordan, *Patents; An appeals court says a mathematical formula can be patented, if it is a moneymaker*, New York Times, August 3, 1998, at D2, Col. 4 (citing "the very broad, very sweeping" nature of the decision); Scott Thurm, *Online: A Flood of Web Patents Stirs Dispute Over Tactics*, Wall Street Journal, October 9, 1998, at B1, Col. 3 (describing the decision as making it easier to obtain patent protection on World Wide Web business methods and referencing fears of the consequences). See also Robert C. Scheinfeld & Parker H. Bagley, *State Street: Virtually Anything is Patentable*, New York Law Journal, September 23, 1998, at 3 (The Federal Circuit's decision "stands for the proposition that any method, including a business method (and even one accomplished without the aid of a computer), constitutes statutory subject matter if it has practical utility....").

The statute provides four categories of subject matter to which a claim may be directed and receive patent protection so long as other requirements such as novelty (35 U.S.C. § 102) and non-obviousness (35 U.S.C. § 103) are met. In the present case the claims are cast as "means plus function" or machine claims. But, as the Federal Circuit recognized, which of the four categories — process, machine, manufacture, or composition of matter — a claim is directed to is "of little relevance" for purposes of § 101 analysis. 149 F.3d at 1372, 47 U.S.P.Q.2d at 1600; *see also In re Walter*, 618 F.2d 758, 768 (C.C.P.A. 1980) (refusing to find labels determinative for § 101 analysis); *In re Johnson*, 589 F.2d 1070, 1077 (C.C.P.A. 1979) (noting that "the form of the claim is often an exercise in drafting"). Drafting artifice is not determinative. As this Court observed in *Benson*, quoting the President's Commission on the Patent System:

> Direct attempts to patent programs have been rejected on the ground of nonstatutory subject matter. Indirect attempts to obtain patents and avoid the rejection, by drafting claims as a process, or a machine or components thereof programmed in a given manner, rather than as a program itself, have confused the issue further and should not be permitted.

409 U.S. at 72. The quoted language from *Benson*, as well as its holding, make clear this Court's position that the loading of a useful program onto a computer is insufficient, without more, to qualify it as patentable subject matter. In its decision in this case, the Circuit Court has simply ignored that position. Referring to the opinion of the Court below, Judge Clevenger of that Court recently stated that "as [the Federal Circuit] recently held [in *State Street*], *virtually anything is patentable* [*subject matter*]." *Hughes Aircraft Co.* v. *U.S.*, 148 F. 3d 1384, 1385 (Fed. Cir. 1998) (Clevenger, J., dissenting) (emphasis added).

Although the statute has been broadly construed to extend to "anything under the sun that is made by man," *Diamond* v. *Chakrabarty*, 447 U.S. 303, 309 n.6 (1980), there have always been limits foreclosing "a purely literal reading of § 101." *Flook*, 437 U.S. at 589. "The laws of nature, physical phenomena, and abstract ideas have been held not patentable." *Chakrabarty*, 447 U.S. at 309. More specifically, *Chakrabarty* expressly recognized the applicability of these limits in the consideration of patent claims for mathematical algorithms. Confirming the continuing soundness of *Flook*, the Court in *Chakrabarty* stated: "That case applied our prior precedents to determine that a 'claim for an improved method of calculation, *even when tied to a specific end use*, is unpatentable subject matter under § 101.'" 447 U.S. at 315 (quoting *Flook*, 437 U.S. at 595 n.18, emphasis added).

2. In the case of mathematical formulae or algorithms, this Court has established the parameters of patentable subject matter in *Benson*, *Flook*, and *Diehr* — decisions which the Federal Circuit has ignored or effectively overruled.

Benson involved "a method of programming a general-purpose digital computer to convert signals from binary-coded decimal form into pure binary form." 409 U.S. at 65. Solving the conversion problem required use of an "algorithm," that is, "a generalized formulation for programs to solve mathematical problems of converting one form of numerical representation to another." *Id.* Noting that ideas are not patentable, the Court held the claimed invention nonstatutory because "[t]he mathematical formula involved . . . ha[d] no substantial practical application except in connection with a digital computer, which means . . . the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." *Id.* at 71-72. Plainly, the issue of utility *vel non* was not dispositive in *Benson*.

In *Benson*, the Court found that the "[t]ransformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include

particular machines." *Id.* at 70. Transforming one set of numbers into another set using a mathematical formula configured on a general purpose computer failed to satisfy this test. The useful and computer implemented algorithm found to be non-patentable subject matter in *Benson* would certainly not have been so found under the Federal Circuit's rationale. Accordingly that rationale should be reviewed — and rejected by this Court.

Parker v. *Flook*, 437 U.S. 584 (1978) also addressed the patentability of a mathematical algorithm run on a general-purpose computer and, once again, the Court held the process unpatentable. In this instance, the claimed invention updated alarm limits for catalytic conversion processes. *Id.* at 585. The Court recognized that "[a]n 'alarm limit' is a number," just as a percentage or a profit or a price is a number. *Id.*

The fact that the patent in *Flook* was directed to an algorithm tied to a specific end use in the form of alarm limits was of no consequence. Citing the unpatentability of the Pythagorean theorem for surveying purposes as an example, the Court found that "'if a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.'" *Id.* at 595 (quoting *In re Richman*, 563 F.2d 1026, 1030 (C.C.P.A. 1977)). To clarify, the Court stated "our holding today is that a claim for an improved method of calculation, *even when tied to a specific end use*, is unpatentable subject matter under § 101." *Id.* at 595 n.18 (emphasis added). Therefore, despite the obvious utility of alarm limits, the Court found that the claimed invention simply calculated numbers and did not satisfy § 101 requirements. Once again, just as with *Benson*, the Federal Circuit's approach would lead to a result opposite to that reached by this Court in *Flook* and should therefore be reviewed and reversed by this Court.

In *Diamond* v. *Diehr*, 450 U.S. 175 (1981), the Court held that a process for curing synthetic rubber employing a well-known mathematical equation and a digital computer was

patentable. Otherwise statutory subject matter did not become nonstatutory simply because it employed a "mathematical formula, computer program, or digital computer." *Id.* at 187.

Viewing the claims as a whole, the *Diehr* Court found that the patent did more than merely claim a mathematical equation. *Id.* at 188. Indeed, steps in the process also included installing rubber in a press, closing the mold, monitoring the temperature of the mold, recalculating cure times, and opening the press at the correct time. *Id.* at 187. Citing *Benson*, the Court found the invention to be within the scope of § 101, noting that the claims "involve[d] the transformation of an article, in this case raw, uncured synthetic rubber, into a different state or thing." *Id.* at 184.

Since the "invention" in the instant case is an algorithm for accounting software that merely calculates numbers, it is not patentable subject matter. *See Benson; Flook.* The Federal Circuit purported to read both *Diehr* and *Chakrabarty* as justifying its excessively expansive result. But neither do. As explained above, *Diehr* involved a process for the physical transformation of a product. Nothing in that case suggested that, by itself, the mere utility of an algorithm is sufficient for it to pass muster under § 101. Further, as noted above, *Chakrabarty* expressly confirmed the continuing vitality of *Flook*, with which the Federal Circuit's pronouncement is in direct conflict.

3. The exclusively utilitarian concept embraced by the Federal Circuit implies that, from now on, scientific principles and laws of nature that should be available to everyone will be patentable subject matter if they produce a useful result. Under the Federal Circuit opinion, contrary to this Court's admonition in *Flook*, 437 U.S. at 590, the Pythagorean theorem would be patentable subject matter whenever it is applied to any useful end. It requires little imagination to envision the mischief that may follow.[3]

[3] It is no answer to leave to litigation, with its attendant costs and uncertainty, the testing of validity of patents issued under the Federal Circuit's

In this computer age, no area of economic life will be untouched by the Federal Circuit's expansion of patentable subject matter. The impact on innovation in areas that have flourished without the patent system cannot be predicted with confidence. It is, finally, unwise and unfair to now subject to the burdens of the patent system activities that have long been outside its ambit. If such a fundamental change is to be made, it is Congress that should do so. *See Flook*, 437 U.S. at 595. Certainly, it ought not to occur without review by this Court.

Conclusion

For the foregoing reasons, the petition for a writ of certiorari should be granted.

Respectfully submitted,

WILLIAM L. PATTON
Counsel of Record
JAMES L. SIGEL
JAMES S. DEGRAW
MARK D. MEREDITH
Ropes & Gray

MAURICE E. GAUTHIER
WILLIAM E. HILTON
Samuels, Gauthier & Stevens

---

expanded view of the boundary established by § 101. This will serve only to "debilitate the patent system." *Graham* v. *John Deere Co.*, 383 U.S. 1, 18 (1967).

United States Court of Appeals for the Federal Circuit

96-1327

STATE STREET BANK & TRUST CO.,

PLAINTIFF-APPELLEE,

v.

SIGNATURE FINANCIAL GROUP, INC.,

DEFENDANT-APPELLANT.

William L. Patton, Ropes & Gray, of Boston, Massachusetts, argued for plaintiff-appellee. With him on the brief were *James L. Sigel* and *James S. DeGraw*. Also on the brief was *Maurice E. Gauthier*, Samuels, Gauthier, Stevens & Reppert.

Steven L. Friedman, Dilworth, Paxson, Kalish & Kauffman LLP, of Philadelphia, Pennsylvania, argued for defendant-appellant. With him on the brief were *Steven J. Henry*, Wolf, Greenfield & Sacks, P.C., of Boston, Massachusetts; and *Philip G. Koenig*, Pittas Koenig, of Winchester, Massachusetts.

William T. Ellis, Foley & Lardner, of Washington, D.C., for amicus curiae Information Technology Industry Council. With him on the brief were *Harold C. Wegner*, *Richard L. Schwaab*, and *Mary Michelle Kile*. Of counsel was *John F. Cooney*, Venable, Baetjer, Howard & Civiletti, LLP.

Robert C. Scheinfeld, Baker & Botts, L.L.P., of New York, New York, for amicus curiae Mastercard International Service. With him on the brief was *Lawrence T. Kass*. Of counsel on the brief for amicus curiae VISA International Service Association were *Laurie S. Hane*, *Donald S. Chisum*, and *Alan L. Durham*, Morrison & Foerster LLP, of Palo Alto, California.

Appealed from: U.S. District Court for the District of Massachusetts

Judge Patti B. Saris

United States Court of Appeals for the Federal Circuit

96-1327

STATE STREET BANK & TRUST CO.,

PLAINTIFF-APPELLEE,

v.

SIGNATURE FINANCIAL GROUP, INC.,

DEFENDANT-APPELLANT.

DECIDED: JULY 23, 1998

BEFORE RICH, PLAGER, AND BRYSON, *Circuit Judges.*
RICH, *Circuit Judge.*

Signature Financial Group, Inc. (Signature) appeals from the decision of the United States District Court for the District of Massachusetts granting a motion for summary judgment in favor of State Street Bank & Trust Co. (State Street), finding U.S. Patent No. 5,193,056 (the '056 patent) invalid on the ground that the claimed subject matter is not encompassed by 35 U.S.C. § 101 (1994). *See State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 927 F. Supp. 502, 38 USPQ2d 1530 (D. Mass. 1996). We reverse and remand because we conclude that the patent claims are directed to statutory subject matter.

BACKGROUND

Signature is the assignee of the '056 patent which is entitled "Data Processing System for Hub and Spoke Financial Services Configuration." The '056 patent issued to Signature on 9 March 1993, naming R. Todd Boes as the inventor. The '056 patent is generally directed to a data processing system (the system) for implementing an investment structure which was developed for use in Signature's business as an administrator and accounting agent for mutual funds. In essence, the system, identified by the proprietary name Hub and Spoke® , facilitates a structure whereby mutual funds (Spokes) pool

their assets in an investment portfolio (Hub) organized as a partnership. This investment configuration provides the administrator of a mutual fund with the advantageous combination of economies of scale in administering investments coupled with the tax advantages of a partnership.

State Street and Signature are both in the business of acting as custodians and accounting agents for multi-tiered partnership fund financial services. State Street negotiated with Signature for a license to use its patented data processing system described and claimed in the '056 patent. When negotiations broke down, State Street brought a declaratory judgment action asserting invalidity, unenforceability, and noninfringement in Massachusetts district court, and then filed a motion for partial summary judgment of patent invalidity for failure to claim statutory subject matter under § 101. The motion was granted and this appeal followed.

DISCUSSION

On appeal, we are not bound to give deference to the district court's grant of summary judgment, but must make an independent determination that the standards for summary judgment have been met. *Vas-Cath, Inc.* v. *Mahurkar*, 935 F.2d 1555, 1560, 19 USPQ2d 1111, 1114 (Fed. Cir. 1991). Summary judgment is properly granted where there are no genuine issues of material fact and the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(c). The substantive issue at hand, whether the '056 patent is invalid for failure to claim statutory subject matter under § 101, is a matter of both claim construction and statutory construction. "[W]e review claim construction *de novo* including any allegedly fact-based questions relating to claim construction." *Cybor Corp.* v. *FAS Techs.*, 138 F.3d 1448, 1451, 46 USPQ2d 1169, 1174 (Fed. Cir. 1998) *(in banc)*. We also review statutory construction *de novo*. *See Romero* v. *United States*, 38 F.3d 1204, 1207 (Fed. Cir. 1994). We hold that declaratory judgment plaintiff State Street was not entitled to the grant of summary judgment of invalidity of the '056 patent under

§ 101 as a matter of law, because the patent claims are directed to statutory subject matter.

The following facts pertinent to the statutory subject matter issue are either undisputed or represent the version alleged by the nonmovant. *See Anderson* v. *Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986). The patented invention relates generally to a system that allows an administrator to monitor and record the financial information flow and make all calculations necessary for maintaining a partner fund financial services configuration. As previously mentioned, a partner fund financial services configuration essentially allows several mutual funds, or "Spokes," to pool their investment funds into a single portfolio, or "Hub," allowing for consolidation of, inter alia, the costs of administering the fund combined with the tax advantages of a partnership. In particular, this system provides means for a daily allocation of assets for two or more Spokes that are invested in the same Hub. The system determines the percentage share that each Spoke maintains in the Hub, while taking into consideration daily changes both in the value of the Hub's investment securities and in the concomitant amount of each Spoke's assets.

In determining daily changes, the system also allows for the allocation among the Spokes of the Hub's daily income, expenses, and net realized and unrealized gain or loss, calculating each day's total investments based on the concept of a book capital account. This enables the determination of a true asset value of each Spoke and accurate calculation of allocation ratios between or among the Spokes. The system additionally tracks all the relevant data determined on a daily basis for the Hub and each Spoke, so that aggregate year end income, expenses, and capital gain or loss can be determined for accounting and for tax purposes for the Hub and, as a result, for each publicly traded Spoke.

It is essential that these calculations are quickly and accurately performed. In large part this is required because each Spoke sells shares to the public and the price of those shares is substantially based on the Spoke's percentage interest

in the portfolio. In some instances, a mutual fund administrator is required to calculate the value of the shares to the nearest penny within as little as an hour and a half after the market closes. Given the complexity of the calculations, a computer or equivalent device is a virtual necessity to perform the task.

The '056 patent application was filed 11 March 1991. It initially contained six "machine" claims, which incorporated means-plus-function clauses, and six method claims. According to Signature, during prosecution the examiner contemplated a § 101 rejection for failure to claim statutory subject matter. However, upon cancellation of the six method claims, the examiner issued a notice of allowance for the remaining present six claims on appeal. Only claim 1 is an independent claim.

The district court began its analysis by construing the claims to be directed to a process, with each "means" clause merely representing a step in that process. However, "machine" claims having "means" clauses may only be reasonably viewed as process claims if there is no supporting structure in the written description that corresponds to the claimed "means" elements. *See In re Alappat*, 33 F.3d 1526, 1540-41, 31 USPQ2d 1545, 1554 (Fed. Cir. 1994) *(in banc)*. This is not the case now before us.

When independent claim 1 is properly construed in accordance with § 112, ¶ 6, it is directed to a machine, as demonstrated below, where representative claim 1 is set forth, the subject matter in brackets stating the structure the written description discloses as corresponding to the respective "means" recited in the claims.

1. A data processing system for managing a financial services configuration of a portfolio established as a partnership, each partner being one of a plurality of funds, comprising:

(a) computer processor means [a personal computer including a CPU] for processing data;

(b) storage means [a data disk] for storing data on a storage medium;

(c) first means [an arithmetic logic circuit configured to prepare the data disk to magnetically store selected data] for initializing the storage medium;

(d) second means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases or decreases based on specific input, allocate the results on a percentage basis, and store the output in a separate file] for processing data regarding assets in the portfolio and each of the funds from a previous day and data regarding increases or decreases in each of the funds, [sic, funds'] assets and for allocating the percentage share that each fund holds in the portfolio;

(e) third means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases and decreases based on specific input, allocate the results on a percentage basis and store the output in a separate file] for processing data regarding daily incremental income, expenses, and net realized gain or loss for the portfolio and for allocating such data among each fund;

(f) fourth means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases and decreases based on specific input, allocate the results on a percentage basis and store the output in a separate file] for processing data regarding daily net unrealized gain or loss for the portfolio and for allocating such data among each fund; and

(g) fifth means [an arithmetic logic circuit configured to retrieve information from specific

> files, calculate that information on an aggregate basis and store the output in a separate file] for processing data regarding aggregate year-end income, expenses, and capital gain or loss for the portfolio and each of the funds.

Each claim component, recited as a "means" plus its function, is to be read, of course, pursuant to § 112, ¶ 6, as inclusive of the "equivalents" of the structures disclosed in the written description portion of the specification. Thus, claim 1, properly construed, claims a machine, namely, a data processing system for managing a financial services configuration of a portfolio established as a partnership, which machine is made up of, at the very least, the specific structures disclosed in the written description and corresponding to the means-plus-function elements (a)-(g) recited in the claim. A "machine" is proper statutory subject matter under § 101. We note that, for the purposes of a § 101 analysis, it is of little relevance whether claim 1 is directed to a "machine" or a "process," as long as it falls within at least one of the four enumerated categories of patentable subject matter, "machine" and "process" being such categories.

This does not end our analysis, however, because the court concluded that the claimed subject matter fell into one of two alternative judicially-created exceptions to statutory subject matter.[1] The court refers to the first exception as the "mathematical algorithm" exception and the second exception as the "business method" exception. Section 101 reads:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement

[1] Indeed, although we do not make this determination here, the judicially created exceptions, i.e., abstract ideas, laws of nature, etc., should be applicable to all categories of statutory subject matter, as our own precedent suggests. *See Alappat*, 33 F.3d at 1542, 31 USPQ2d at 1556; *see also In re Johnson*, 502 F.2d 765, 183 USPQ 172 (CCPA 1974) (Rich, J., dissenting).

> thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The plain and unambiguous meaning of § 101 is that any invention falling within one of the four stated categories of statutory subject matter may be patented, provided it meets the other requirements for patentability set forth in Title 35, i.e., those found in §§102, 103, and 112, ¶ 2.[2]

The repetitive use of the expansive term "any" in § 101 shows Congress's intent not to place any restrictions on the subject matter for which a patent may be obtained beyond those specifically recited in § 101. Indeed, the Supreme Court has acknowledged that Congress intended § 101 to extend to "anything under the sun that is made by man." *Diamond* v. *Chakrabarty*, 447 U.S. 303, 309 (1980); *see also Diamond* v. *Diehr*, 450 U.S. 175, 182 (1981).[3] Thus, it is improper to read limitations into § 101 on the subject matter that

---

[2] As explained in *In re Bergy*, 569 F.2d 952, 960, 201 USPQ 352, 360 (CCPA 1979) (emphases and footnote omitted):

> The first door which must be opened on the difficult path to patentability is § 101.... The person approaching that door is an inventor, whether his invention is patentable or not.... Being an inventor or having an invention, however, is no guarantee of opening even the first door. What kind of an invention or discovery is it? In dealing with the question of kind, as distinguished from the qualitative conditions which make the invention patentable, § 101 is broad and general; its language is: "any *** process, machine, manufacture, or composition of matter, or any *** improvement thereof." Section 100(b) further expands "process" to include "art or method, and *** a new use of a known process, machine, manufacture, composition of matter, or material." If the invention, as the inventor defines it in his claims (pursuant to § 112, second paragraph), falls into any one of the named categories, he is allowed to pass through to the second door, which is § 102; "novelty and loss of right to patent" is the sign on it. Notwithstanding the words "new and useful" in § 101, the invention is not examined under that statute for novelty because that is not the statutory scheme of things or the long-established administrative practice.

[3] The Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to "include anything under the sun that is made by man." S. Rep. No. 82-1979 at 5 (1952); H.R. Rep. No. 82-1923 at 6 (1952).

may be patented where the legislative history indicates that Congress clearly did not intend such limitations. *See Chakrabarty*, 447 U.S. at 308 ("We have also cautioned that courts 'should not read into the patent laws limitations and conditions which the legislature has not expressed.'" (citations omitted)).

The "Mathematical Algorithm" Exception

The Supreme Court has identified three categories of subject matter that are unpatentable, namely "laws of nature, natural phenomena, and abstract ideas." *Diehr*, 450 U.S. at 185. Of particular relevance to this case, the Court has held that mathematical algorithms are not patentable subject matter to the extent that they are merely abstract ideas. *See Diehr*, 450 U.S. 175, *passim; Parker* v. *Flook*, 437 U.S. 584 (1978); *Gottschalk* v. *Benson*, 409 U.S. 63 (1972). In *Diehr*, the Court explained that certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application, i.e., "a useful, concrete and tangible result." *Alappat*, 33 F.3d at 1544, 31 USPQ2d at 1557.[4]

Unpatentable mathematical algorithms are identifiable by showing they are merely abstract ideas constituting disembodied concepts or truths that are not "useful." From a practical standpoint, this means that to be patentable an algorithm must be applied in a "useful" way. In *Alappat*, we held that data, transformed by a machine through a series of mathematical calculations to produce a smooth waveform display on a rasterizer monitor, constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it produced "a useful, concrete and tangible result" — the smooth waveform.

---

[4] This has come to be known as the mathematical algorithm exception. This designation has led to some confusion, especially given the Freeman-Walter-Abele analysis. By keeping in mind that the mathematical algorithm is unpatentable only to the extent that it represents an abstract idea, this confusion may be ameliorated.

Similarly, in *Arrythmia Research Technology Inc.* v. *Corazonix Corp.*, 958 F.2d 1053, 22 USPQ2d 1033 (Fed. Cir. 1992), we held that the transformation of electrocardiograph signals from a patient's heartbeat by a machine through a series of mathematical calculations constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it corresponded to a useful, concrete or tangible thing — the condition of a patient's heart.

Today, we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result" — a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.

The district court erred by applying the Freeman-Walter-Abele test to determine whether the claimed subject matter was an unpatentable abstract idea. The Freeman-Walter-Abele test was designed by the Court of Customs and Patent Appeals, and subsequently adopted by this court, to extract and identify unpatentable mathematical algorithms in the aftermath of *Benson* and *Flook*. *See In re Freeman*, 573 F.2d 1237, 197 USPQ 464 (CCPA 1978) as modified by *In re Walter*, 618 F.2d 758, 205 USPQ 397 (CCPA 1980). The test has been thus articulated:

> First, the claim is analyzed to determine whether a mathematical algorithm is directly or indirectly recited. Next, if a mathematical algorithm is found, the claim as a whole is further analyzed to determine whether the algorithm is "applied in any manner to physical elements or process steps," and, if it is, it "passes muster under § 101."

In re Pardo, 684 F.2d 912, 915, 214 USPQ 673, 675-76 (CCPA 1982) (citing *In re Abele*, 684 F.2d 902, 214 USPQ 682

(CCPA 1982)).[5]

After *Diehr* and *Chakrabarty*, the Freeman-Walter-Abele test has little, if any, applicability to determining the presence of statutory subject matter. As we pointed out in *Alappat*, 33 F.3d at 1543, 31 USPQ2d at 1557, application of the test could be misleading, because a process, machine, manufacture, or composition of matter employing a law of nature, natural phenomenon, or abstract idea is patentable subject matter even though a law of nature, natural phenomenon, or abstract idea would not, by itself, be entitled to such protection.[6] The

---

[5] The test has been the source of much confusion. In *In re Abele*, 684 F.2d 902, 214 USPQ 682 (CCPA 1982), the CCPA upheld claims applying "a mathematical formula within the context of a process which encompasses significantly more than the algorithm alone." *Id.* at 909. Thus, the CCPA apparently inserted an additional consideration — the significance of additions to the algorithm. The CCPA appeared to abandon the application of the test in *In re Taner*, 681 F.2d 787, 214 USPQ 678 (CCPA 1982), only to subsequently "clarify" that the Freeman-Walter-Abele test was simply not the exclusive test for detecting unpatentable subject matter. *In re Meyer*, 688 F.2d 789, 796, 215 USPQ 193, 199 (CCPA 1982).

[6] *See e.g. Parker* v. *Flook*, 437 U.S. 584, 590 (1978) ("[A] process is not unpatentable simply because it contains a law of nature or a mathematical algorithm."); *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948) ("He who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes. If there is to be invention from such a discovery, it must come from the application of the law to a new and useful end."); *Mackay Radio & Tel. Co.* v. *Radio Corp. of Am.*, 306 U.S. 86, 94 (1939) ("While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be.").

> [W]hen a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101.

Diehr, 450 U.S. at 192; *see also In re Iwahashi*, 888 F.2d 1370, 1375, 12 USPQ2d 1908, 1911 (Fed. Cir. 1989); *Taner*, 681 F.2d at 789, 214 USPQ at 680. The dispositive inquiry is whether the claim as a whole is directed to statutory subject matter. It is irrelevant that a claim may contain, as part of the whole, subject matter which would not be patentable by itself. "A claim drawn to subject matter otherwise statutory does not become

test determines the presence of, for example, an algorithm. Under *Benson*, this may have been a sufficient indicium of nonstatutory subject matter. However, after *Diehr* and *Alappat*, the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a "useful, concrete and tangible result." *Alappat*, 33 F.3d at 1544, 31 USPQ2d at 1557.[7] After all, as we have repeatedly stated,

> every step-by-step process, be it electronic or chemical or mechanical, involves an algorithm in the broad sense of the term. Since § 101 expressly includes processes as a category of inventions which may be patented and § 100(b) further defines the word "process" as meaning "process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material," it follows that it is no ground for holding a claim is directed to nonstatutory subject matter to say it includes or is directed to an algorithm. This is why the proscription against patenting has been limited to *mathematical* algorithms....

In re Iwahashi, 888 F.2d 1370, 1374, 12 USPQ2d 1908, 1911 (Fed. Cir. 1989) (emphasis in the original).[8]

---

nonstatutory simply because it uses a mathematical formula, computer program or digital computer." *Diehr*, 450 U.S. at 187.

[7] As the Supreme Court expressly stated in *Diehr*, its own holdings in *Benson* and *Flook* "stand for no more than these long-established principles" that abstract ideas and natural phenomena are not patentable. *Diehr*, 450 U.S. at 185 (citing *Chakrabarty*, 447 U.S. at 309 and *Funk Bros.*, 333 U.S. at 130.).

[8] In *In re Pardo*, 684 F.2d 912 (CCPA 1982), the CCPA narrowly limited "mathematical algorithm" to the execution of formulas with given data. In the same year, in *In re Meyer*, 688 F.2d 789, 215 USPQ 193 (CCPA 1982), the CCPA interpreted the same term to include any mental process that can be represented by a mathematical algorithm. This is also the position taken by the PTO in its Examination Guidelines, 61 Fed. Reg. 7478, 7483 (1996).

The question of whether a claim encompasses statutory subject matter should not focus on *which* of the four categories of subject matter a claim is directed to[9] — process, machine, manufacture, or composition of matter—but rather on the essential characteristics of the subject matter, in particular, its practical utility. Section 101 specifies that statutory subject matter must also satisfy the other "conditions and requirements" of Title 35, including novelty, nonobviousness, and adequacy of disclosure and notice. *See In re Warmerdam*, 33 F.3d 1354,1359, 31 USPQ2d 1754, 1757-58 (Fed. Cir. 1994). For purpose of our analysis, as noted above, claim 1 is directed to a machine programmed with the Hub and Spoke software and admittedly produces a "useful, concrete, and tangible result." *Alappat*, 33 F.3d at 1544, 31 USPQ2d at 1557. This renders it statutory subject matter, even if the useful result is expressed in numbers, such as price, profit, percentage, cost, or loss.

The Business Method Exception

As an alternative ground for invalidating the '056 patent under § 101, the court relied on the judicially-created, so-called "business method" exception to statutory subject matter. We take this opportunity to lay this ill-conceived exception to rest. Since its inception, the "business method" exception has merely represented the application of some general, but no longer applicable legal principle, perhaps arising out of the "requirement for invention" — which was eliminated by § 103. Since the 1952 Patent Act, business methods have been, and should have been, subject to the same legal requirements for patentability as applied to any other process or method.[10]

---

[9] Of course, the subject matter must fall into at least one category of statutory subject matter.

[10] As Judge Newman has previously stated,

> [The business method exception] is . . . an unwarranted encumbrance to the definition of statutory subject matter in section 101, that [should] be discarded as error-prone, redundant, and obsolete. It merits retirement from the glossary of section

The business method exception has never been invoked by this court, or the CCPA, to deem an invention unpatentable.[11] Application of this particular exception has always been preceded by a ruling based on some clearer concept of Title 35 or, more commonly, application of the abstract idea exception based on finding a mathematical algorithm. Illustrative is the CCPA's analysis in *In re Howard*, 394 F.2d 869, 157 USPQ 615 (CCPA 1968), wherein the court affirmed the Board of Appeals' rejection of the claims for lack of novelty and found it unnecessary to reach the Board's section 101 ground that a method of doing business is "inherently unpatentable." *Id.* at 872, 157 USPQ at 617.[12]

Similarly, *In re Schrader*, 22 F.3d 290, 30 USPQ2d 1455 (Fed. Cir. 1994), while making reference to the business method exception, turned on the fact that the claims implicitly recited an abstract idea in the form of a mathematical algorithm and there was no "transformation or conversion of subject matter representative of or constituting physical activity or objects." 22 F.3d at 294, 30 USPQ2d at 1459 (emphasis omitted).[13]

> 101.... All of the "doing business" cases could have been decided using the clearer concepts of Title 35. Patentability does not turn on whether the claimed method does "business" instead of something else, but on whether the method, viewed as a whole, meets the requirements of patentability as set forth in Sections 102, 103, and 112 of the Patent Act.

In re Schrader, 22 F.3d 290, 298, 30 USPQ2d 1455, 1462 (Fed. Cir. 1994) (Newman, J., dissenting).

[11] *See* Rinaldo Del Gallo, III, *Are 'Methods of Doing Business' Finally out of Business as a Statutory Rejection?*, 38 IDEA 403, 435 (1998).

[12] *See also Dann* v. *Johnston*, 425 U.S. 219 (1976) (the Supreme Court declined to discuss the section 101 argument concerning the computerized financial record-keeping system, in view of the Court's holding of patent invalidity under section 103); *In re Chatfield*, 545 F.2d 152, 157, 191 USPQ 730, 735 (CCPA 1976); *Ex parte Murray*, 9 USPQ2d 1819, 1820 (Bd. Pat. App. & Interf. 1988) ("[T]he claimed accounting method [requires] no more than the entering, sorting, debiting and totaling of expenditures as necessary preliminary steps to issuing an expense analysis statement....") states grounds of obviousness or lack of novelty, not of non-statutory subject matter.

[13] Any historical distinctions between a method of "doing" business and the means of carrying it out blur in the complexity of modern business

State Street argues that we acknowledged the validity of the business method exception in *Alappat* when we discussed *Maucorps* and *Meyer:*

> *Maucorps* dealt with a business methodology for deciding how salesmen should best handle respective customers and *Meyer* involved a 'system' for aiding a neurologist in diagnosing patients. Clearly, neither of the alleged 'inventions' in those cases falls within any § 101 category.

Alappat, 33 F.3d at 1541, 31 USPQ2d at 1555. However, closer scrutiny of these cases reveals that the claimed inventions in both *Maucorps* and *Meyer* were rejected as abstract ideas under the mathematical algorithm exception, not the business method exception. *See In re Maucorps*, 609 F.2d 481, 484, 203 USPQ 812, 816 (CCPA 1979); *In re Meyer*, 688 F.2d 789, 796, 215 USPQ 193, 199 (CCPA 1982).[14]

Even the case frequently cited as establishing the business method exception to statutory subject matter, *Hotel Security Checking Co.* v. *Lorraine Co.*, 160 F. 467 (2d Cir. 1908), did not rely on the exception to strike the patent.[15] In that case,

---

systems. *See Paine, Webber, Jackson & Curtis* v. *Merrill Lynch*, 564 F. Supp. 1358, 218 USPQ 212 (D. Del. 1983), (holding a computerized system of cash management was held to be statutory subject matter.)

[14] Moreover, these cases were subject to the *Benson* era Freeman-Walter-Abele test — in other words, analysis as it existed before *Diehr* and *Alappat*.

[15] *See also Loew's Drive-In Theatres* v. *Park-In Theatres*, 174 F.2d 547, 552 (1st Cir. 1949) (holding that the means for carrying out the system of transacting business lacked "an exercise of the faculty of invention"); *In re Patton*, 127 F.2d 324, 327-38 (CCPA 1942) (finding claims invalid as failing to define patentable subject matter over the references of record.); *Berardini* v. *Tocci*, 190 F. 329, 332 (C.C.S.D.N.Y. 1911); *In re Wait*, 73 F.2d 982, 983 (CCPA 1934) ("[S]urely these are, and always have been, essential steps in all dealings of this nature, and even conceding, without holding, that some methods of doing business might present patentable novelty, we think such novelty is lacking here."); *In re Howard*, 157 USPQ 615, 617 (CCPA 1968) ("[W]e therefore affirm the decision of the Board of Appeals on the ground that the claims do not define a novel process ... [so we find it] unnecessary to consider the issue of whether a method of doing business is inherently unpatentable."). Although a clearer statement was made in *In re Patton*, 127 F.2d 324, 327, 53 USPQ 376, 379 (CCPA 1942) that a

the patent was found invalid for lack of novelty and "invention," not because it was improper subject matter for a patent. The court stated "the fundamental principle of the system is as old as the art of bookkeeping, i.e., charging the goods of the employer to the agent who takes them." *Id.* at 469. "If at the time of [the patent] application, there had been no system of bookkeeping of any kind in restaurants, we would be confronted with the question whether a new and useful system of cash registering and account checking is such an art as is patentable under the statute." *Id.* at 472.

This case is no exception. The district court announced the precepts of the business method exception as set forth in several treatises, but noted as its primary reason for finding the patent invalid under the business method exception as follows:

> If Signature's invention were patentable, any financial institution desirous of implementing a multi-tiered funding complex modelled (sic) on a Hub and Spoke configuration would be required to seek Signature's permission before embarking on such a project. *This is so because the '056 Patent is claimed [sic] sufficiently broadly to foreclose virtually any computer-implemented accounting method necessary to manage this type of financial structure.*

927 F. Supp. 502, 516, 38 USPQ2d 1530, 1542 (emphasis added). Whether the patent's claims are too broad to be patentable is not to be judged under § 101, but rather under §§102, 103 and 112. Assuming the above statement to be correct, it has nothing to do with whether what is claimed is statutory subject matter.

In view of this background, it comes as no surprise that in the most recent edition of the Manual of Patent Examining Procedures (MPEP) (1996), a paragraph of § 706.03(a) was deleted. In past editions it read:

---

system for transacting business, separate from the means for carrying out the system, is not patentable subject matter, the jurisprudence does not require the creation of a distinct business class of unpatentable subject matter.

> Though seemingly within the category of process or method, a method of doing business can be rejected as not being within the statutory classes. *See Hotel Security Checking Co.* v. *Lorraine Co.*, 160 F. 467 (2nd Cir. 1908) and *In re Wait*, 24 USPQ 88, 22 CCPA 822 (1934).

MPEP § 706.03(a) (1994). This acknowledgment is buttressed by the U.S. Patent and Trademark 1996 Examination Guidelines for Computer Related Inventions which now read:

> Office personnel have had difficulty in properly treating claims directed to methods of doing business. Claims should not be categorized as methods of doing business. Instead such claims should be treated like any other process claims.

Examination Guidelines, 61 Fed. Reg. 7478, 7479 (1996). We agree that this is precisely the manner in which this type of claim should be treated. Whether the claims are directed to subject matter within § 101 should not turn on whether the claimed subject matter does business instead of something else.

CONCLUSION

The appealed decision is reversed and the case is remanded to the district court for further proceedings consistent with this opinion.

REVERSED and REMANDED.

UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

STATE STREET BANK AND TRUST COMPANY,
PLAINTIFF,
v.
SIGNATURE FINANCIAL GROUP, INC.,
DEFENDANT.

CIVIL ACTION NO. 94-11344-PBS

MEMORANDUM AND ORDER

March 26, 1996

SARIS, U.S.D.J.

I. Introduction

Plaintiff, State Street Bank and Trust Company ("State Street") brings this action against Defendant, Signature Financial Group, Inc. ("Signature"), seeking a declaratory judgment that Signature's patent for a computerized accounting system for managing a mutual fund investment structure is invalid and unenforceable.[1] After hearing, the Court *ALLOWS* Plaintiff's motion for partial summary judgment and *DISMISSES* Defendant's counter-claims.

II. Background

State Street and Signature are companies, which, among other things, act as administrators and accounting agents of

[1] The Complaint seeks the following declaratory judgments: invalidity (Count I), noninfringement (Count II), unenforceability by reason of inequitable conduct (Count III), and unenforceability by reason of misuse (Count IV). Signature has filed two counter-claims: that State Street has committed an unfair and deceptive trade practice in violation of M.G.L. c. 93A by bringing the present declaratory judgment action in an attempt to maintain market share and malign Defendant (Count I), and its own declaratory judgment that an agent of State Street had entered into a binding oral licensing agreement with Signature regarding the data processing system allegedly protected by State Street's patent (Count II).

mutual funds. Signature owns U.S. Patent No. 5,193,056 ("'056 Patent"), entitled "Data Processing System for Hub and Spoke Financial Services Configuration," issued on March 9, 1993, by assignment of the inventor, R. Todd Boes. As the patent summary states, the claimed "invention provides a data processing system and method for monitoring and recording the information flow and data, and making all calculations, necessary for maintaining a partnership portfolio and partner fund (Hub and Spoke) financial services configuration." In order to assess the scope and nature of the claimed invention, it is first necessary to discuss briefly the financial configuration which the data processing system is designed to service.

A. *Hub and Spoke Configuration*

The invention relates to a newly-developed financial investment vehicle, which State Street terms a "multi-tiered fund complex" and Signature calls by its own proprietary mark, a "Hub and Spoke" configuration. In essence, a Hub and Spoke arrangement is an investment structure whereby mutual funds ("Spokes") pool their assets in an investment portfolio ("Hub") organized as a partnership. "This financial services configuration involves an entity that is treated as a partnership for federal income tax purposes and that holds the investment portfolio . . . and funds that invest as partners in the partnership portfolio." '056 Patent, col. 1. Enabling mutual funds to pool their assets in this manner provides for economies of scale with regard to the costs of fund administration and has beneficial tax consequences.

This complex financial structure, however, creates its own set of administrative challenges. As a partnership, the Hub portfolio assesses all economic gains and losses with respect to the Spoke funds on a pro rata basis. Because each of the Spokes are themselves investment vehicles, which are subject to constant changes in assets as individual investors add or withdraw funds and market prices fluctuate, the partnership interest of the Spokes in the Hub constantly varies. Admin-

istering this structure requires a daily allocation of income, capital gains, and expenses or investment losses. The daily allocations are made on the basis of the Spoke funds' percentage share in the total assets of the Hub portfolio.

B. *The Claimed Invention*

Signature's invention is directed to a data processing system for administering this Hub and Spoke configuration. The disclosure provides extensive flowcharts and a detailed description of the invention's preferred embodiment. The system is operated by means of a personal computer, software capable of performing the various functions described in the claims and detailed in the preferred embodiment and flowcharts, data storage means such as a floppy disk, and display means such as printed output and a computer screen.

Specifically, the invention calculates and stores data representing: the percentage share that each Spoke fund holds in the Hub portfolio; any daily activity affecting the portfolio's assets; allocations of gains, losses and expenses to each of the Spoke member funds; and tracking and updating data that are used to determine aggregate year-end income, gains, losses, and expenses for accounting and tax purposes.

The invention is claimed in means-plus-function language as an apparatus.[2] Of the six claims, only the first is independent:

(1) A data processing system for managing a financial services configuration of a portfolio established as a partnership, each partner being one of a plurality of funds, comprising:

---

[2] The use of means-plus-function langauge results in construction of the claim as an apparatus (i.e., machine) rather than a method (i.e., process), even if no discrete devices or structures are described in the claim itself. *See* U.S.C. § 112, para. 6. Structure is imparted to the apparatus claims by reference to devices or apparatus disclosed in the specification. *See In re Donaldson Co.*, 16 F.3d 1189, 1192-94 (Fed. Cir. 1994) (en banc).

(a) computer processor means for processing data:

(b) storage means for storing data on a storage medium;

(c) first means for initializing the storage medium;

(d) second means for processing data regarding assets in the portfolio and each of the funds from a previous day and data regarding increases or decreases in each of the funds, assets and for allocating the percentage share that each fund holds in the portfolio;

(e) third means for processing data regarding daily incremental income, expenses, and net realized gain or loss for the portfolio and for allocating such data among each fund;

(f) fourth means for processing data regarding daily net unrealized gain or loss for the portfolio and for allocating such data among each fund; and

(g) fifth means for processing data regarding aggregate year-end income, expenses, and capital gain or loss for the portfolio and each of the funds.

The specification discloses the specific structure, circuitry or other devices by which the invention operates as follows:

> The portfolio/fund accountant makes use of a personal computer 44 programmed with software 50. One example of software 50 is the "HandS" (a service mark of Signature Financial Group, Inc.) computer program. The personal computer 44 used by portfolio/fund accountant is capable of producing printed output 46 and storing data on data disk 52, which preferably is a floppy disk, although other types of storage media may be used.

'056 Patent, col. 6 (numbers are references to flowcharts included in specification).

By way of patent prosecution history, the patent examiner apparently pondered whether to deny patentability on statutory-subject matter grounds but after consultation with other examiners determined that the claimed invention was directed to statutory subject matter. The patent application originally included both apparatus and method claims. The

six apparatus claims were determined to be patentable, while the six method claims (phrased identically to the apparatus claims except for the absence of means-plus-function language as used in claim one quoted above) were rejected. Indeed, throughout the patent specification, there are numerous references to the invention as a "data processing system and method," even though the claims themselves state only an apparatus. '056 Patent, col. 4-5. The record does not disclose why the method claims were not successfully prosecuted.

Signature admits that it informed State Street that any data processing system designed to perform book accounting for a multi-tiered fund arranged in a Hub and Spoke configuration likely would infringe the '056 Patent. Answer ¶ 12. State Street serves as the custodian and accounting agent for several multi-tiered fund complexes and had negotiated with Signature for a license for its patented data processing system. When negotiations broke down, State Street brought the present declaratory judgment action seeking to invalidate Signature's patent.

III. Analysis

State Street alleges that Signature's patent is not drawn to statutory subject matter under 35 U.S.C. § 101 because the invention claims an unpatentable mathematical algorithm as defined by established Supreme Court precedent. Signature counters that its data processing system is a computer-implemented invention that is patentable both under recent Federal Circuit precedent and guidelines for patent examiners issued by the U.S. Patent and Trademark Office ("PTO").

The core issue on summary judgment is whether computer software that essentially performs mathematical accounting functions and is configured to run on a general purpose (i.e., personal) computer is patentable under 35 U.S.C § 101. "[T]he question whether computer-related inventions driven by mathematically-based software deserve the market protection afforded under federal patent law has vexed both

theorists and practitioners since computers entered the marketplace some thirty years ago." John A. Burtis, *Towards a Rational Jurisprudence of Computer-Related Patentability in Light of In re Alappat*, 79 MINN. L. REV. 1129, 1129 (1995). It is into this jurisprudential quagmire that the Court must dive.

A. *Summary Judgment*

Unlike the question presented in this case, the standards for summary judgment are familiar and well defined. "Summary judgment is appropriate when 'the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to judgment as a matter of law.'" *"Barbour* v. *Dynamics Research Corp.*, 63 F.3d 32, 36 (1st Cir. 1995) (quoting Fed. R. Civ. P. 56(c)). "To succeed [in a motion for summary judgment], the moving party must show that there is an absence of evidence to support the nonmoving party's position." *Rogers* v. *Fair*, 902 F.2d 140, 143 (1st Cir. 1990); *see also Celotex Corp.* v. *Catrett*, 477 U.S. 317, 325 (1986).

"Once the moving party has properly supported its motion for summary judgment, the burden shifts to the non-moving party, who 'may not rest on mere allegations or denials of his pleading, but must set forth specific facts showing there is a genuine issue for trial.'" *Barbour*, 63 F.3d at 37 (quoting *Anderson* v. *Liberty Lobby, Inc.*, 477 U.S. 242, 256 (1986)). "There must be 'sufficient evidence favoring the nonmoving party for a jury to return a verdict for that party. If the evidence is merely colorable or is not significantly probative, summary judgment may be granted.'" *Rogers*, 902 F.2d at 143 (quoting *Anderson*, 477 U.S. at 249-50) (citations and footnote in *Anderson* omitted). The Court must "view the facts in the light most favorable to the non-moving party, drawing all reasonable inferences in that party's favor." *Barbour*, 63 F.3d at 36.

The standard for summary judgment here is no different

from that traditionally employed by courts as "summary judgment is as appropriate in a patent case as any other." *Avia Group Int'l Inc.* v. *L.A. Gear Calif., Inc.*, 853 F.2d 1557, 1561 (Fed. Cir. 1988). Moreover, "whether a claim is directed to statutory subject matter is a question of law," *Arrythmia Research Technology, Inc.* v. *Corazonix Corp.*, 958 F.2d 1053, 1055 (Fed. Cir. 1992), that is particularly amenable to decision on summary judgment.

To prevail on its motion for summary judgment, State Street must overcome a statutory presumption favoring the validity of Signature's '056 Patent. *See* 35 U.S.C. § 282; *Checkpoint Systems, Inc.* v. *United States Int'l Trade Comm'n*, 54 F.3d 756, 761 (Fed. Cir. 1995) ("A patent is presumed valid [,and] the presumption of validity . . . places the burden of going forward and of persuasion on the party asserting invalidity.").

B. *General Principles of Subject-Matter Patentability*

> Section 101 of Title 35 of the U.S. Code provides:
> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Thus, the statute sets out four categories of subject matter — process, machine, manufacture, and composition of matter — that are entitled to patent protection provided that the other requirements of patentability (i.e., novelty and non-obviousness under 35 U.S.C. §§ 102-103) are satisfied. Although § 101 has been broadly construed to "include anything under the sun that is made by man," *Diamond* v. *Chakrabarty*, 447 U.S. 303, 309-10 (1980) (quoting legislative history of 1952 recodification), "[t]his is not to suggest that § 101 has no limits or that it embraces every discovery." *Id.* "To include some things [in § 101] is to exclude others." *In re Warmerdam*, 33 F.3d 1354, 1358 (Fed. Cir. 1994).

"An idea is itself not patentable, but a new device by which it may be made practically useful is." *Rubber-Tip Pencil Co.* v. *Howard*, 87 U.S. (20 Wall.) 498, 507 (1874). Over time, the Supreme Court further explained this limit to subject matter patentability:

> The laws of nature, physical phenomena, and abstract ideas have been held not patentable. Thus, a new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not patent his celebrated law that $E = mc^2$; nor could Newton have patented the law of gravity. Such discoveries "are manifestations of ... nature, free to all men and reserved exclusively to none."

Chakrabarty, 447 U.S. at 309 (quoting *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948)) (citations omitted). Therefore, "[while a scientific truth, or the mathematical expression of it, is not patentable invention, a novel and useful structure created with the aid of scientific truth may be." *Mackay Radio & Telegraph Co., Inc.* v. *Radio Corp. of America*, 306 U.S. 86, 92-94 (1939).

The reason for this rule is simple, "[p]henomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." *Gottschalk* v. *Benson*, 409 U.S. 63, 67 (1972). Granting a patent monopoly on the use of a scientific principle, rather than on its particular practical application, would impede rather than "promote the Progress of Science and useful Arts." U.S. Const. Art. I, cl. 8 (patent and copyright clause).

This distinction between abstract idea and patentable subject matter, however, is more easily stated than applied. For example, while the capacity of electricity to be used as a mode of communication is not itself patentable, the specific manifestation of that idea in Morse's electric telegraph was held patentable. *See O'Reilly* v. *Morse*, 56 U.S. (15 How.) 62, 117 (1853). Similarly, a mathematical equation is not itself patentable, but its use in a computer-automated synthetic

rubber curing process was held statutory subject matter. *See Diamond* v. *Diehr*, 450 U.S. 175, 185-88 (1981) (holding patentable computer-implemented rubber curing process because inventors' "process admittedly employs a well-known mathematical equation, but [the inventors] do not seek to preempt use of that equation. Rather, they seek only to foreclose from others the use of that equation in conjunction with all the other steps in their claimed process.").

The determination of patentability of computer software is particularly difficult because a computer program directs the computer to perform mathematical functions (i.e., process data) to achieve a desired result. *See* Jur Strobos, *Stalking the Elusive Patentable Software*, 6 HARV. J.L. & TECH. 363, 377 (1993) ("A computer program is nothing more than a series of mathematical steps conducted by a machine composed of electronic switches and storage sites."); *cf.* David L. Stewart, *Patenting of Software — Proposed Guidelines and the Magic Dividing Line that Disappeared*, 77 J. PAT. & TRADEMARK OFF. SOC'Y 681, 684-88 (1995) (mathematics are nothing more than a symbolic language for expressing abstract relationships); *Random House Unabridged Dictionary* 1186 (2d ed. 1993) (defining mathematics as "the synthetic treatment of magnitude, relationships between figures and forms, and relations between quantities expressed symbolically.").

C. *The Supreme Court Trilogy*

A trilogy of Supreme Court opinions grapples with the scope of patent protection to afford computer software. The first, *Gottschalk* v. *Benson*, 409 U.S. 63, 65 (1972), involved an attempt to patent "a method of programming a general-purpose digital computer to convert signals from binary-coded decimal form into pure binary form." The mathematical procedures in *Benson* could be carried out "in existing computers long in use, no new machinery being necessary." *Id.* at 67. Such conversion was achieved through what the Court

termed an algorithm, defined as "[a] procedure for solving a given type of mathematical problem." *Id.* The Court held that the claimed process was not statutory:

> It is conceded that one may not patent an idea. But in practical effect that would be the result if the formula . . . were patented in this case. The mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that . . . the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself.

Id. at 71-72. Allowing a patent on a computer program that simply converts one set of numbers into another would preempt the mathematical formula on which the software was based. Thus, the Court held the patent invalid.

Although the Court stopped short of holding that a computer software program was never patentable, it held the "transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim, that does not include particular machines." *Id.* at 256. The processing of numbers by means of a mathematical equation via a general purpose computer was not sufficient to satisfy this requirement.

In the second case, *Parker* v. *Flook*, 437 U.S. 584 (1978), the Court similarly held unpatentable a process for updating "alarm limits" for the catalytic conversion of hydrocarbons. Unlike *Benson*, here the patent was directed to a mathematical formula or algorithm tied to a specific post-solution activity (i.e., adjusting alarm limits at which chemical reactions become unstable). *Flook*, 437 U.S. at 586-87. The Court held:

> The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance. A competent draftsman could attach some form of post-solution activity to almost any mathematical formula; the Pythagorean theorem would

> not have been -patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques.

Id. at 590. Notwithstanding any field-of-use limitation, the claimed invention merely calculated numerical values. Adopting the reasoning of the Court of Customs and Patent Appeals ("C.C.P.A.") (the Federal Circuit's predecessor), the Court held "'if a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.'" *Id.* at 595 (quoting *In re Richman*, 563 F.2d 1026,1030 (C.C.P.A. 1977)). "Very simply", the Court noted, "[O]ur holding today is that a claim for an improved method of calculation, even when tied to a specific end use, is unpatentable subject matter under § 101." *Id.* at 594 n.18.

The final installment in the trilogy is *Diamond* v. *Diehr*, 450 U.S. 175 (1981), where the Court held that a process for curing synthetic rubber that employed a computer was patentable. The process involved a well-known mathematical formula coupled with constant measurement of temperature inside a mold; a computer calculated ongoing changes in temperature and automatically terminated the curing process at the proper point with a degree of precision theretofore unknown in the art.

The Court distinguished *Benson* and *Flook* by demonstrating that the claimed process in *Diehr* involved more than calculating abstract numerical values. 450 U.S. at 188 (formula for computing an alarm limit was nonpatentable because it was "simply a number."). Rather, the claimed process "involve[d] the transformation of an article, in this case raw, uncured synthetic rubber, into a different state or thing." *Id.* at 184. This element of physical transformation, hinted at in *Benson* and *Flook*, was made explicit in *Diehr:*

> We recognize, of course, that when a claim recites a mathematical formula (or scientific principle or phenomenon of nature), an inquiry must be made into

> whether the claim is seeking patent protection for that formula in the abstract. A mathematical formula as such is not accorded the protection of our patent laws, and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.... On the other hand, when a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (e.g., *transforming or reducing an article to a different state or thing)*, then the claim satisfied the requirements of § 101.

450 U.S. at 191-92 (citations to *Benson* and *Flook* omitted and emphasis added). The Court clarified that a claim does not become eligible for patent protection simply because all possible uses of the mathematical formula are not preempted. *Id.* at 192, n.14.

In dissent, Justice Stevens took the position that the "broad question whether computer programs should be given patent protection involves policy considerations that this Court is not authorized to address." *Id.* at 216-17. In this confusing area, he urged that his concerns would better be addressed by:

> (1) an unequivocal holding that no program-related invention is a patentable process under § 101 unless it makes a contribution to the art that is not dependent entirely on the utilization of a computer, and (2) an unequivocal explanation that the term "algorithm" as used in this case, as in *Benson* and *Flook*, is synonymous with the term "computer program."

450 U.S. at 219. This suggestion was consistent with Justice Douglas' earlier statement in *Benson*, where, writing for the majority, he urged Congress to clarify this murky issue through legislation. 409 U.S. at 72-73 (quoting President's Commission on the Patent System (1966)). Unfortunately, however, the Supreme Court has not re-visited this question since *Diehr* and Congress has yet to legislate in this area.

Critical commentators have interpreted the Supreme Court's trilogy as establishing preemption and physical transformation as the twin touchstones of patent protection for computer software. *See* Lawrence Kass, *Computer Software Patentability and the Role of Means-Plus-Function Format in Computer Software Claims*, 15 PACE L. REV. 787 (1995) ("The Supreme Court elaborated on the *Benson* proscription against patenting pure mathematical algorithms in *Parker* v. *Flook* and *Diamond* v. *Diehr*, which collectively circumscribed what may be termed a 'physicality requirement' for processes that contain mathematical algorithms."); Strobos, *supra*, at 387 ("These two ... requirements for software patentability, are hereinafter referred to as the 'preemption' and 'transformation' inquiries, respectively.... The first addresses preemption of human use of this equation by 'head and hand.' The second addresses whether the particular claimed use is a process with a product, or a transformation and reduction of a particular entity, such as input data, to a different state, rather than an idea or 'patent protection for that formula in the abstract.'") (quoting *Diehr*, 450 U.S. at 184, 187, 190).

D. *The Freeman-Walter-Abele Test and Subsequent Federal Circuit Precedent*

The C.C.P.A. devised a two-part test, also followed by its successor, the Federal Circuit, to implement the principles elucidated above. *See In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994) (noting this two-part analysis is not sole means of determining whether a computer-implemented invention is patentable but that it remains a useful analytic tool). Gleaned from three cases,[3] the analysis is known as the Freeman-Walter-Abele test, which the Federal Circuit has recently described as follows:

---

[3] *See In re Abele*, 684 F.2d 902 (C.C.P.A. 1982); *In re Walter*, 618 F.2d 758 (C.C.P.A. 1980); *In re Freeman*, 573 F.2d 1237 (C.C.P.A. 1978).

> It is first determined whether a mathematical algorithm is recited directly or indirectly in the claim. If so, it is next determined whether the claimed invention as a whole is no more than the algorithm itself; that is, whether the claim is directed to a mathematical algorithm that is not applied to or limited by physical elements or process steps. Such claims are nonstatutory. However, when the mathematical algorithm is applied to one or more elements of an otherwise statutory process claim, ... the requirements of section 101 are met.

In re Schrader, 22 F.3d 290, 292 (Fed. Cir. 1994) (quoting *Arrhythmia*, 958 F.2d at 1058). To be patentable under this test, an invention must "comprise an otherwise statutory process whose mathematical procedures are applied to physical process steps." *Arrhythmia*, 958 F.2d at 1059.

Signature seeks to avoid application of this test, however, by arguing that its patent claims a machine rather than a process, and a machine is explicitly statutory under § 101. Consistent with this position, the Federal Circuit recently held that computer software becomes physical apparatus when run on a general purpose computer. *See Alappat*, 33 F.3d at 1545 ("We have held that [] programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software."); *In re Lowry*, 32 F.3d 1579, 1583 (Fed. Cir. 1994) (data structures designed to permit computer to run more efficiently "impart a physical organization on the information stored in memory"). Therefore, computer software configured to run on a general purpose computer, if claimed in means-plus-function patent language, is considered a new machine or apparatus as a matter of patent interpretation.

As the Federal Circuit also recognized, however, this issue is not determinative. Regardless of whether the claim is drafted as process or apparatus, the Federal Circuit held that the mathematical algorithm/physical transformation test for statutory subject matter under § 101 applies even to "true

apparatus" claims. *Alappat*, 33 F.3d at 1542. The C.C.P.A. also adopted this view:

> Labels are not determinative in § 101 inquiries. "*Benson* applies equally whether an invention is claimed as an apparatus or process, because the form of the claim is often an exercise in drafting." *In re Johnson*, 589 F.2d 1070, 1077 (C.C.P.A. 1978) .... Moreover, that the claimed computing system may be a 'machine' within 'the ordinary sense of the word,' ... is irrelevant.

In re Maucorps, 609 F.2d 481, 485 (C.C.P.A. 1979). The analysis of the patentability of claimed subject matter therefore does not hinge on whether the claim is drafted in means-plus-function language.[4]

As repeated thrice by the Supreme Court and echoed by the Federal Circuit and the C.C.P.A., the best clue to patentability remains the mathematical algorithm/physical transformation test. *See, e.g.*, *Alappat*, 33 F.3d at 1540-45 (holding that claimed apparatus — a "rasterizer" — that employs mathematical algorithm to enable oscillator to convert discrete wave form data samples into output illumination data for display on screen is statutory); *Arrhythmia*, 958 F.2d at 1058-61 (claimed process and apparatus that relate to improved means of electronically measuring heart activity are statutory; "resulting output is not an abstract number, but is a signal related to the patient's heart activity."); *In re*

[4] A short illustration will suffice to bring this point home. A portion of the process claim in *Benson* read, "[t]he method of converting signals from binary coded decimal form into binary which comprises the steps of ... (1) storing the binary coded decimal signals in a reentrant shift register...." 409 U.S. at 73. Recast in means-plus-function language, this identical claim would read, "[an apparatus for] converting signals from binary coded decimal form into binary [, comprising:] (1) [means for] storing the binary coded decimal signals." The specification would disclose a reentrant shift register as the necessary data storage means. By Signature's reasoning, this purely semantic change would permit a patent on the *Benson* algorithm. The Supreme Court's holding there did not turn on such semantic differences, and neither will the holding of this Court.

Iwahashi, 888 F.2d 1370 (Fed. Cir. 1989) (holding statutory device that transforms human voice data). Although the Federal Circuit's developing precedent is not crystal clear on this point,[5] this test remains the best guidepost for determining the patentability of computer software.

Accordingly, in *Schrader*, the Federal Circuit declined to afford patent protection for a linear computer program applied to solving business problems. 22 F.3d at 292. There, the claimed invention involved a novel way of conducting auctions by specifying a method of competitive bidding on a plurality of related items, such as contiguous tracts of land or the like, so as to maximize sales revenue or profit to the seller. The court upheld the rejection of the claimed process on the ground it was a non-statutory mathematical algorithm. Contrasting claims that "involved the transformation or conversion of subject matter representative of or constituting physical activity or objects," as in *Arrhythmia*, the court held that the entering of bids in a record was non-patentable "data gathering" and calculating bids to maximize sales revenue simply involved processing one set of numbers into another. *Schrader*, 22 F.3d at 293; *accord Alappat*, 33 F.3d at 1526 (suggesting that a "business methodology for deciding how salesmen should best handle respective customers . . . [does not] fall[] within any § 101 category.") (citing *Maucorps); In re Grams*, 888 F.2d 835, 840 (Fed. Cir. 1989) (pre-solution data gathering steps do not impart patentability to invention claiming mathematical algorithm); *cf. In re Trovato*, 42 F.3d

[5] Several commentators have lamented that the Federal Circuit has not clearly defined the scope of subject matter patentability in this complex area. *See* Burtis, *supra*, at 1152 (noting that post-*Alappat* "[t]his area of law cries out for a new approach, faithful to Supreme Court precedent yet not unnecessarily constrained by a wealth of inconsistent lower court doctrines."); Ronald S. Laurie & Joseph K. Siino, *A Bridge Over Troubled Waters? The PTO's Proposed Examination Guidelines for Computer-Implemented Inventions and the Federal Circuit's View(s) on Software Patentability*, 415 PLI/Pat 103, 103 (1995) ("[T]he [Federal Circuit cases dealing with software patentability] collectively represent a range of legal perspectives, and defy attempts at full reconciliation, although individual facts affecting patentability can be identified.").

1376, 1380-83 (Fed. Cir. 1994) (holding non-statutory apparatus that calculates numerical values representing shortest distance between two points in "physical task space"), *vacated*, 60 F.3d 807(Fed. Cir. 1995) (en banc) (for reconsideration in light of new patent guidelines).

E. *The PTO Examination Guidelines*

Recently issued PTO guidelines support this computer software patentability paradigm. On February 28, 1996, Examination Guidelines for Computer-Related Inventions ("Guidelines") were published in the *Federal Register* and formally will become effective on March 29, 1996. 61 Fed. Reg. 7478 (1996). The Guidelines are designed to assist patent examiners in reviewing applications during patent prosecution and are intended to be consistent with Supreme Court and Federal Circuit precedent. *Id.* at 7479.

Although published in the *Federal Register*, the "Guidelines do not constitute substantive rulemaking and hence do not have the force and effect of law." *Id.* In its order vacating the initial panel decision in *Trovato*, however, the Federal Circuit sitting en banc recently suggested that the Guidelines may be persuasive authority. 60 F.3d at 807.[6] Given that the expertise of patent examiners is statutorily recognized, *see Interconnect Planning Corp.* v. *Feil*, 774 F.2d 1132, 1139 (Fed. Cir. 1985), the Court finds that a brief discussion of the Guidelines is helpful here.

As a threshold matter, the PTO provided a framework for analyzing claims that encompass "any machine or manufacture embodiment of a process" as follows:

> If a product claim encompasses any and every computer implementation of a process, when read in light of the specification, it should be examined on the basis of the underlying process.

---

[6] Dissenting from the en banc opinion, Judges Nies and Michel argued that *Trovato* should not be read as "an advisory opinion endorsing the proposed guidelines." 60 F.3d at 808.

Guidelines, 61 Fed. Reg. at 7482. In other words, when determining whether computer software is patentable, the manner in which it is claimed is not itself determinative, particularly when the claim language is so broad that any and all means of implementing the claimed functions on a computer would be covered by the patent. The PTO, and this Court, must look beyond the claim drafting to determine what functions the invention performs. If the underlying process performed by the software is non-statutory, a machine claim for the same invention is non-statutory. *Id.* at 7482-83.

The Guidelines state that "a process that merely manipulates an abstract idea or performs a purely mathematical algorithm is non-statutory despite the fact that it might inherently have some usefulness." *Id.* at 7484. Incorporating the physical transformation test heretofore described in detail, the Guidelines also provide:

> If the 'acts' of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. Thus, *a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process.*

Id. (emphasis added). The Guidelines point out that a claimed process "that consists solely of mathematical operations is non-statutory whether or not it is performed on a computer." *Id.* However, a process will receive statutory protection if it is limited to a practical application of the abstract idea or mathematical algorithm in the technological arts (i.e., involve some species of physical transformation of input data). *Id.*[7]

---

[7] The examples given in the Guidelines demonstrate the diffuculty in applying these general principles and were helpful to this Court only when referring to particular cases.

F. *The '056 Patent Analyzed*

With the foregoing in mind, the Court will analyze the '056 Patent to determine whether Signature's claimed invention, a data processing system, is drawn to statutory subject matter.

1. *Step One: Mathematical Algorithm Test*

The first step in determining whether the '056 Patent is drawn to statutory subject matter is deciding whether it recites, directly or indirectly, a mathematical algorithm, which the Supreme Court in *Benson* described as "a procedure for solving a given type of mathematical problem." 409 U.S. at 65; *see also Schrader*, 22 F.3d at 293; *Arrhythmia*, 958 F.2d at 1056 n.3. Under this broad definition, any series of mathematical operations or calculations recite a mathematical algorithm. *Cf. Alappat*, 33 F.3d at 1542-43 & nn. 18-20 (analyzing Supreme Court trilogy and noting that opinions use terms interchangeably).[8]

Although the '056 Patent claims do not directly recite a mathematical formula, the data processing system is an apparatus specifically designed to solve a mathematical problem. Indeed, the specification is quite clear in this regard: "The present invention provides a data processing system and method for monitoring and recording the information flow and data, and *making all calculations*, necessary for maintaining a partnership portfolio and partner fund (Hub and

[8] This Court recognizes that the Federal Circuit in *Alappat* cautioned against relying exclusively on the mathematical algorithm test. 33 F.3d at 1542-43 (mathematical algorithm exception simply short-hand expression of principle "that certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas . . . ."). Therefore, the Court parses the '056 Patent not only to determine whether it states a mathematical algorithm but also to judge "whether the claim . . . goes beyond simply manipulating 'abstract ideas' or 'natural phenomena.'" *Warmerdam*, 33 F.2d at 1360. The mathematical algorithm test is only the first step in this inquiry.

Spoke) financial services configuration." '056 Patent col.4 (emphasis added). The specification also is replete with flow charts that describe the numerous data processing steps. Most importantly, the claims themselves recite calculating data as a function of the machine. *Id.* at col. 13-15 (claims 3-6).

These calculations, among others, include: (1) daily allocating the assets of two or more funds that are invested in the partnership portfolio; (2) determining each fund's percentage share in the partnership entity, taking into consideration incremental changes in the portfolio's investment securities and the amount of each fund's assets; (3) allocating to each fund the portfolio's daily income, expenses, and net unrealized gain or loss; and (4) tracking and storing this information for calculating annual tax information. Interpreted in light of the specification, the '056 Patent claims recite means for solving a series of mathematical problems.

This conclusion gains support from the Federal Circuit's decision in *Schrader*. There, the patent claimed a method for grouping bids at a competitive auction in order to maximize revenue for the seller. 22 F.3d at 291-92. The Court held that "[t]he claim language . . . describes the solving of a mathematical problem: determining the optimal combination of bids." *Id.* at 293. The C.C.P.A. reached the same conclusion in earlier cases. *See Maucorps*, 609 F.2d at 486 ("[A]ppellants' claimed invention as a whole comprises each and every means for carrying out a solution technique for a set of equations wherein one number is computed from a set of numbers."); *In re Gelnovatch*, 595 F.2d. 32, 41 n.7 (C.C.P.A. 1979) ("Appellants' process as a whole comprises a solution technique for a set of equations wherein sets of numbers are computed from other sets of numbers."). An invention that inputs, processes, and outputs numbers must by definition perform mathematical operations.

2. *Step Two: Physical Transformation Test*

The second step under the Freeman-Walter-Abele test is

determining whether the claimed invention is applied to or limited by physical elements or process steps. Regardless of whether the invention performs mathematical operations, if it transforms or reduces subject matter to a different state or thing, it is statutory under § 101. While not conclusive, the clue is physical transformation. The Court holds that Signature's data processing system fails this physicality test.

The invention claimed by the '056 Patent is unlike the computer-implemented inventions that the Federal Circuit has deemed statutory in the past. *Alappat* held patentable a device for transforming numerical values to display smooth waveform data on an oscilloscope. Through mathematical operations that could be performed on a computer, the "rasterizer" permitted an oscilloscope to operate in a manner theretofore not possible and thus was "a specific machine to produce a useful, concrete, and tangible result." 33 F.3d at 1544. At least as described in the majority opinion, the physical transformation (i.e., discrete waveform data samples into anti-aliased pixel illumination data to be displayed on a display means) went beyond manipulation of mathematical constructs. *But see Id.* at 1564 (Archer, C.J., dissenting) (arguing that "rasterizer *is* simply the mathematical conversion of data" which should not be patentable) (emphasis in original).

Similarly, *Arrhythmia* involved an invention that enabled a certain type of human heart activity to be measured, processed, and displayed electronically. Although mathematical calculations were part of the process, the invention "was properly viewed as a method of analyzing electrocardiograph signals in order to determine a specified heart activity." 958 F.2d at 1059. "[T]he number obtained is not a mathematical abstraction; it is a measure in microvolts of a specified heart activity, an indicator of the risk of ventricular tachycardia." *Id.* at 1060. This transformation also was sufficiently physical to warrant patent protection. *See also Abele*, 684 F.2d at 908-909 (holding patentable invention involving physical transformation of x-ray data for display on CAT scan); *In re*

Taner, 681 F.2d 787, 790 (C.C.P.A. 1982) (holding statutory computer-implemented method of seismic exploration).[9]

Signature's invention does not involve this type of transformation. Rather, like other accounting methods, it is designed to manipulate and record numbers. Unlike the electrocardiograph in *Arrhythmia* and the CAT scan in *Abele*, Signature's data processing system does not "involve[] the transformation or conversion of subject matter representative of or constituting physical activity or objects." *Schrader*, 22 F.3d at 294. And, unlike the rasterizer in *Alappat*, the invention does not physically convert the data upon which it operates into a new and totally different form. A change of one set of numbers into another, without more, is insufficient to confer patent protection. The invention does nothing other than present and solve a mathematical algorithm and, therefore, is not patentable. *Cf. Abele*, 684 F.2d at 904 (requiring invention to do more than "present and solve a mathematical algorithm" to be statutory).

Consistent with this Court's conclusion, the Federal Circuit recently held non-statutory a computer-implemented invention that compiled, processed and stored business data. As previously noted, in *Schrader*, the patent application claimed a method for grouping bids at auction to maximize sales revenue for the auctioneer. The court held that "there is nothing physical about bids *per se*. Thus, the grouping or regrouping of bids cannot constitute a physical change, effect,

---

[9] Even in *Lowry*, which involved the patentability of "data structures" under §§ 102-103, the court based its decision in part on the fact that these mathematical constructs worked a "physical" change upon the computer itself that increased its operational efficiency. 32 F.3d at 1583. Here the invention does not claim data structures. Moreover, because *Lowry* does not include a discussion of subject matter patentability under § 101, it is of little assistance in the present matter. In addition, a different panel of the Federal Circuit held data structures to be unpatentable under § 101. *See Warmerdam*, 33 F.3d at 1360.

or result." 22 F.3d at 293-94. An additional step of recording the compiled bid data was insufficient to confer patentability because "the step of entering data into a 'record' is implicit in any application of a mathematical algorithm." *Id.* at 294. Citing the Supreme Court in *Flook* and the Federal Circuit in *In re Grams*, the court noted that both pre-solution data gathering activity and insignificant post-solution activity (i.e., recording data) "in a claim involving the solving of a mathematical algorithm could not impart patentability to the claim." *Schrader*, 22 F.3d at 294 (citing *Flook*, 437 U.S. at 590; *In re Grams*, 888 F.2d 835, 840 (Fed. Cir. 1989)).

The C.C.P.A. reached the same conclusion on similar facts. In *Maucorps*, the claims were drawn to an apparatus for determining the optimum number of times a salesman should visit a client over a given length of time. 609 F.2d at 484-85. The sales model was held unpatentable because the "claimed invention as a whole comprises each and every means for carrying out a solution technique for a set of equations wherein one number is computed from a set of numbers." *Id.* at 486. As noted by the *Alappat* Court, the business methodology in *Maucorps* clearly did not fall within any § 101 category. *Alappat*, 33 F.3d at 1541.

Signature's data processing system similarly does not fall within § 101's enumeration of patentable subject matter. Like the business-related systems in *Schrader* and *Maucorps*, the '056 Patent claims an invention that essentially performs mathematical calculations on data gleaned from pre-solution activity and stores and displays the results. As with *Schrader*'s bids, the fact that those numbers represent financial constructs, such as the Hub and Spoke configuration, does not save Signature's patent. The claims do not recite any significant pre- or post-solution activity. Neither does the invention measure physical objects or phenomena as in *Arrhythmia* or *Abele* nor does it physically convert data into a different form as in *Alappat*.

"In all instances, this critical question must be answered: 'What did applicants invent?" *Grams*, 888 F.2d at 839

(quoting *Abele*, 684 F.2d at 907). At bottom, the invention is an accounting system for a certain type of financial investment vehicle claimed as means for performing a series of mathematical functions. Quite simply, it involves no further physical transformation or reduction than inputting numbers, calculating numbers, outputting numbers, and storing numbers. The same functions could be performed, albeit less efficiently, by an accountant armed with pencil, paper, calculator, and a filing system. "The dispositive issue is whether the claim[s] as a whole recite[] sufficient physical activity to constitute patentable subject matter." *Schrader*, 22 F.3d at 294 n.9. The Court holds that Signature's data processing system does not.

G. *The Business Methods Exception*

The Court's decision comports with another doctrinal exclusion from subject matter patentability known as the "business methods exception." Numerous patent treatises recite the long-established principle that "business 'plans' and 'systems' are not patentable, even though they may not be dependent upon the aesthetic, emotional, or judgmental reactions of a human." 1 Donald S. Chisum, *Patents: A Treatise on the Law of Patentability, Validity and Infringement* § 1.03[5] at 1-75 (1990); *see also* 1 Ernest Bainbridge Lipscomb III, *Walker on Patents* § 2:17 at 171 (3d ed. 1984) ("[A] 'system' or method of transacting business is not an 'art,' [i.e., process] nor does it come within any other designation of patentable subject matter . . . apart from the physical means of conducting the system."); 1 Peter D. Rosenberg, *Patent Law Fundamentals* § 6.02[3] at 6-82 (2d ed. 1995) ("Whereas an apparatus or system capable of performing a business function may comprise patentable subject matter, the law remains that a method of doing business whether or not generated by an apparatus or system does not constitute patentable subject matter.").

As established by a series of older cases, business methods are unpatentable abstract ideas. *See Loew's Drive-In Theatres, Inc.* v. *Park-In Theatres, Inc.*, 174 F.2d 547, 552 (1st Cir.) (equating methods of doing business with abstract idea doctrine), *cert. denied*, 338 U.S. 822 (1949); *Hotel Security Checking Co.* v. *Lorraine Co.*, 160 F. 467, 469 (2d Cir. 1908) (same). Recent decisions, while not holding explicitly on these grounds, recognize the continued validity of that rule. *See Alappat*, 33 F.3d at 1541 (suggesting that "business methodology" is not § 101 subject matter); *Grams*, 888 F.3d at 837 (listing "methods of doing business" as among categories of non-patentable subject matter); *Ex parte Murray*, 9 U.S.P.Q.2d 1819, 1820 (PTO Bd. of Patent App. & Int. 1988) (declaring non-statutory bank accounting system). *But see Paine, Webber, Jackson & Curtis, Inc.* v. *Merrill Lynch, Pierce, Fenner & Smith, Inc.*, 564 F. Supp. 1358, 1369 (D. Del. 1983) (holding patentable computerized system of combining package of popular financial services because invention did not recite *Benson* algorithm); *Schrader*, 22 F.3d at 297 (Newman, J. dissenting) (urging that the method of doing business exception be "described as error-prone, redundant and obsolete.")

If Signature's invention were patentable, any financial institution desirous of implementing a multi-tiered funding complex modelled on a Hub and Spoke configuration would be required to seek Signature's permission before embarking on such a project. This is so because the '056 Patent is claimed sufficiently broadly to foreclose virtually any computer-implemented accounting method necessary to manage this type of financial structure. Indeed, during licensing negotiations, Signature informed State Street that any data processing system designed to perform book accounting for a multi-tiered fund based on a partnership portfolio configuration would infringe the '056 Patent. *See* Answer ¶12.

In effect, the '056 Patent grants Signature a monopoly on its idea of a multi-tiered partnership portfolio investment structure; patenting an accounting system necessary to carry

on a certain type of business is tantamount to a patent on the business itself. Because such abstract ideas are not patentable, either as methods of doing business or as mathematical algorithm, the '056 Patent must fail.

IV. Signature's Counter-Claims

Signature has made two counterclaims under M.G.L. c. 93A: (1) a damages claim against State Street for bringing what Signature alleges to have been frivolous litigation and falsely claiming that its patent was invalid (Count I); and (2) a declaration that State Street is bound by an oral licensing agreement over use of the data processing system (Count II).

The Court *sua sponte* may decide issues relating to the scope of its subject-matter jurisdiction. *See* Fed. R. Civ. P. 12(h)(3) ("Whenever it appears by suggestion of the parties or otherwise that the court lacks jurisdiction of the subject matter, the court shall dismiss the action."). Signature claims that the Court has jurisdiction over these counter-claims pursuant to 28 U.S.C. §§ 1338(b), 1367, and 2201. Sections 2201 and 1338(b) are provisions enabling the Court to grant declaratory relief and granting jurisdiction to assert claims of unfair competition "when joined with a substantial and related claim" under the patent laws. Section 1367 governs the Court's exercise of supplemental jurisdiction.

The Court's decision granting State Street's motion for summary judgment necessarily also disposes of the first of Signature's counter-claims. Certainly, no unfair trade practice claim can be maintained based on the frivolity of State Street's declaratory judgment action once State Street's requested relief has been granted. Therefore, this first counter-claim is dismissed.

This ruling dispenses with all claims over which the Court had original jurisdiction. Subject matter jurisdiction was predicated solely on the federal patent claims, and there is no diversity jurisdiction as the parties both have their principle place of business in Massachusetts. Thus, the second

counterclaim is before this Court solely under its supplemental jurisdiction. Section 1367 provides that this Court "may decline to exercise supplemental jurisdiction over a claim . . . if . . . the district court has dismissed all claims over which it has original jurisdiction." 28 U.S.C. § 1367(c)(3).

Whether declaratory relief should be accorded to Signature based on the validity of an alleged oral license agreement is a question best presented to a state court. At this early stage in the proceedings, when neither party has briefed or presented evidence on this state claim, considerations of judicial economy dictate that the counter-claim be dismissed without prejudice. *See McIntosh* v. *Antonino*, 71 F.3d 29, 33 n.3 (1st Cir. 1995) (holding that when district court appropriately grants summary judgment on federal claim, it may dismiss remaining supplemental claims if no legitimate federal question exists).[10]

V. Conclusion and Order

For the foregoing reasons, the Court holds that the '056 Patent is directed to non-statutory subject matter under § 101 and is therefore invalid. Accordingly, State Street's motion for partial summary judgment (Docket 44-1) is *ALLOWED*. Also for the reasons stated above, Signature's counter-claims are hereby *DISMISSED* — the second one involving the alleged oral licensing system — without prejudice.

/s/ PATTI B. SARIS
United States District Judge

[10] As neither party has briefed this issue, the Court would entertain a motion for reconsideration as to this disposition of the counter-claims.

NOTE: Pursuant to Fed. Cir. R. 47.6, this order is not citable as precedent. It is a public order.

United States Court of Appeals for the Federal Circuit

96-1327

STATE STREET BANK AND TRUST COMPANY,
PLAINTIFF-APPELLEE,
V.
SIGNATURE FINANCIAL GROUP, INC.,
DEFENDANT-APPELLANT.

ON MOTION
Before RICH, *Circuit Judge*.

ORDER

State Street Bank and Trust Company moves to stay issuance of the mandate pending a petition for certiorari to the Supreme Court. Signature Financial Group, Inc. opposes.

Upon consideration thereof,

IT IS ORDERED THAT:

State Street's motion to stay issuance of the mandate is granted. Within 14 days of the grant or denial of State Street's petition, State Street must notify the court. In the event the Supreme Court denies the petition, the clerk of this court will issue the mandate.

28 Aug. '98
Date

/s/ Giles S. Rich
Giles S. Rich
Circuit Judge

cc: William L. Patton, Esq,
Steven L. Friedman, Esq.
William T. Ellis, Esq.
Robert C. Scheimfeld, Esq.
Laurie S. Hane, Esq.

No. 98-657

FILED
NOV 19 1998
OFFICE OF THE CLERK
SUPREME COURT, U.S.

In The

Supreme Court of the United States

October Term, 1998

STATE STREET BANK AND TRUST COMPANY,

Petitioner,

v.

SIGNATURE FINANCIAL GROUP, INC.,

Respondent.

On Petition For A Writ Of Certiorari To The United States Court Of Appeals For The Federal Circuit

BRIEF IN OPPOSITION

STEVEN L. FRIEDMAN
Counsel of Record
THOMAS S. BIEMER
DILWORTH PAXSON LLP
3200 The Mellon Bank Center
1735 Market Street
Philadelphia, PA 19103
(215) 575-7140

and

STEVEN J. HENRY
WOLF, GREENFIELD & SACKS, P.C.
Federal Reserve Plaza
600 Atlantic Avenue
Boston, MA 02210
(617) 720-3500

Counsel for Respondent

Date: November 19, 1998

COCKLE LAW BRIEF PRINTING CO., (800) 225-6964
OR CALL COLLECT (402) 342-2831

QUESTION PRESENTED

Whether the definition of patentable subject matter in 35 U.S.C. § 101, which includes "any new and useful . . . machine," encompasses a data processing machine that produces a useful, concrete, and tangible result.

PARTIES TO THE PROCEEDING AND DISCLOSURE UNDER SUP.CT.R. 29.6

The petition accurately lists the parties to the proceeding. Respondent Signature Financial Group, Inc., a corporate defendant, has no parent companies, subsidiaries or affiliates that have issued shares to the public.

TABLE OF CONTENTS

Page

QUESTION PRESENTED i

PARTIES TO THE PROCEEDING AND DISCLOSURE UNDER SUP.CT.R. 29.6 ii

TABLE OF CONTENTS iii

TABLE OF AUTHORITIES iv

STATEMENT OF THE CASE 1

REASONS FOR DENYING THE PETITION 5

The Question Presented by State Street Is Hypothetical and Was Not Determinative of the Federal Circuit's Decision 5

The Federal Circuit's Decision Properly Applied the Statute and This Court's Holdings 7

State Street's "Impact Statement" Directly Contradicts the Policies of the Patent Act 12

CONCLUSION 16

TABLE OF AUTHORITIES

Page

CASES

Arrhythmia Research Technology, Inc. v. Corazonix Corp., 958 F.2d 1053, 22 USPQ 2d 1033 (Fed. Cir. 1993) 10, 11

Blanchard v. Sprague, 3 F.Cas. 648 (C.C.D. Mass. 1839) 15

Diamond v. Chakrabarty, 447 U.S. 303 (1980) 8, 9, 10, 13

Diamond v. Diehr, 450 U.S. 175 (1981) 7, 8, 9, 10, 11

Funk Bros. Seed & Co. v. Kalo Inoculant Co., 333 U.S. 127 (1948) 9

Gottschalk v. Benson, 409 U.S. 63 (1972) 9

In re Alappat, 33 F.3d 1526, 31 USPQ 2d 1545 (Fed. Cir. 1994) (*en banc*) 2, 10, 11, 13, 15

In re Bergy, 597 F.2d 952, 201 USPQ 352 (CCPA 1979) 15

In re Donaldson Co., 16 F.3d 1189, 29 USPQ 2d 1845 (Fed. Cir. 1994) (*en banc*) 2

In re Iwahashi, 888 F.2d 1370, 12 USPQ 2d 1908 (Fed. Cir. 1989) 11

In re Warmerdam, 33 F.3d 1354, 31 USPQ 2d 1754 (Fed. Cir. 1994) 11

Parker v. Flook, 437 U.S. 584 (1978) 9

CONSTITUTIONS, STATUTES AND REGULATIONS

U.S. Const. Art. I, § 8, cl. 8 8

35 U.S.C. § 101 ..... *passim*

TABLE OF AUTHORITIES – Continued

Page

35 U.S.C. § 102 15

35 U.S.C. § 103 15

35 U.S.C. § 112, ¶ 1 15

35 U.S.C. § 112, § 2 15

35 U.S.C. § 112, ¶ 6 ..... 1, 2

61 Fed. Reg. 7478 (1996) 12

LEGISLATIVE MATERIALS

S. Rep. No. 1979, 82d Cong., 2d Sess. 5 (1952) 8

H.R. Rep. No. 1923, 82d Cong., 2d Sess. 6 (1952) 8

OTHER AUTHORITIES

A.J. Haitling, L. Druffel, F. Hilbing, *Introduction to Computer Programming: A Problem Solving Approach* (1983) 3

Slind-Flor, *Patents For Financial Programs OK*, Nat'l L.J., Aug. 10, 1998, at 1, col. 1 12

Tam, *What's Next? Getting Patents For Cold Calls?*, Wall St. J., Nov. 2, 1998, at 1, col. 1 12

STATEMENT OF THE CASE

Petitioner advances a single assertion – that the subject matter claimed in United States Patent No. 5,193,056 (the " '056 Patent") is the equivalent of abstract mathematics and, therefore, not directed to patentable subject matter under 35 U.S.C. § 101. The Federal Circuit, however, properly recognized that the claims of the '056 Patent, when construed in accordance with 35 U.S.C. § 112, ¶ 6, are directed to one of the explicitly enumerated categories of statutory subject matter contained in § 101 – namely, a new and useful machine. *State Street Bank and Trust Company v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1372, 47 USPQ 2d 1596, 1599-1600 (Fed. Cir. 1998).[1] The Federal Circuit also properly rejected the argument that a new and useful machine is abstract mathematics. 149 F.3d at 1373-74, App. A to Petition at A-5 to A-7. In reaching its conclusion, the Federal Circuit applied the plain language of § 101 and the teachings of this Court to conclude that a claim directed to a new machine that produces a useful, concrete and tangible result is statutory subject matter.

The patented invention relates generally to a new form of investment structure developed by Signature Financial Group, Inc. ("Signature"). Importantly, State Street Bank & Trust Company ("State Street") concedes that the claimed invention is not the financial concept *per se*, but rather a data processing system capable of administering the structure. *See* Petition at p. 4. In short, this

---

[1] Cites to the Federal Circuit's Opinion in *State Street* will include a citation to the Appendix filed with the Petition for Writ of Certiorari ("Petition").

new and useful tool allows an administrator to monitor and record the financial information flow and make all calculations necessary to administer the financial services configuration. *State Street*, 149 F.3d at 1371, App. A to Petition at A-4.

In determining that the '056 Patent is directed to statutory subject matter, the Federal Circuit logically began by construing the claims. 149 F.3d at 1371, App. A to Petition at A-5. The claims are drafted in means plus function format as permitted by 35 U.S.C. § 112, ¶ 6. When read in reference to the detailed specification and figures, the data processing system includes a personal computer programmed with software that executes instructions to perform the various functions required for administering the financial services configuration. For example, claim 1 recites in clauses (a) through (g) specific structural elements, including a computer processor means and a storage means. *State Street*, 149 F.3d at 1371, App. A to Petition at A-5 to A-6.

The Federal Circuit explicitly rejected the district court's analysis, advanced here by State Street, that the claims could be viewed as directed to a process, with each "means" clause merely representing a step in the process. *Id.* Rather, when independent claim 1 is properly construed in accordance with 35 U.S.C. § 112,¶ 6 and the holdings of two *en banc* decisions of the Federal Circuit,[2]

---

[2] *See In re Alappat*, 33 F.3d 1526, 1541, 31 USPQ 2d 1545, 1554 (Fed. Cir. 1994) (*en banc*) (when claims include means-plus-function elements, § 112, ¶ 6 must be applied in § 101 analysis); *In re Donaldson Co.*, 16 F.3d 1189, 1193, 29 USPQ 2d 1845, 1848 (Fed. Cir. 1994) (*en banc*) (under § 112, ¶ 6, means-plus-function

it is directed to a machine with the subject matter in the brackets representing the structure disclosed in the written description that corresponds to the respective "means" recited in the claims:

> (1) A data processing system[3] for managing a financial services configuration of a portfolio established as a partnership, each partner being one of a plurality of funds, comprising:
>
> (a) computer processor means [a personal computer including a CPU] for processing data;
>
> (b) storage means [a data disk] for storing data on a storage medium;

---

elements must be construed in light of the corresponding structure described in the patent's specification).

[3] A "data processing system" is defined in the art as "a device [a computer] capable of accepting data from some external source, processing the data in accordance with a set of prescribed operations, and outputting the results to some external recipient. In accordance with this definition, you might say that a computer is a *machine* that processes information and can be viewed as in Figure 1-1."

FIGURE 1-1

Data Processing System

=

Raw Data

↓

Data Processing Operation

↓

Useful Information

A.J. Haitling, L. Druffel, F. Hilbing, *Introduction to Computer Programming: A Problem Solving Approach,* at pp. 2-3 (1983). (Emphasis added.)

(c) first means [an arithmetic logic circuit configured to prepare the data disk to magnetically store selected data] for initializing the storage medium;

(d) second means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases or decreases based on specific input, allocate the results on a percentage basis, and store the output in a separate file] for processing data regarding assets in the portfolio and each of the funds from a previous day and data regarding increases or decreases in each of the funds [sic, funds'] assets and for allocating the percentage share that each fund holds in the portfolio;

(e) third means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases and decreases based on specific input, allocate the results on a percentage basis and store the output in a separate file] for processing data regarding daily incremental income, expenses, and net realized gain or loss for the portfolio and for allocating such data among each fund;

(f) fourth means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases and decreases based on specific input, allocate the results on a percentage basis and store the output in a separate file] for processing data regarding daily net unrealized gain or loss for the portfolio and for allocating such data among each fund; and

(g) fifth means [an arithmetic logic circuit configured to retrieve information from specific files, calculate that information on an aggregate

> basis, and store the output in a separate file] for processing data regarding aggregate year-end income, expenses and capital gain or loss for the portfolio and each of the funds.

149 F.3d at 1371-72, App. A to Petition at A-5 to A-7 (bracketed information added by the Federal Circuit.)

Once the claims were properly construed as a machine, the Federal Circuit correctly concluded that the claims were directed to statutory subject matter. First, Judge Rich,[4] writing for a unanimous panel, noted that a "machine" is proper statutory subject under the plain terms of § 101. 149 F.3d at 1372, App. A to Petition at A-7. Next, he examined whether the claimed subject matter fell into any of the narrow, judicially-created exceptions. In holding that it did not, the Federal Circuit applied the fundamental principles announced by this Court's holdings on § 101 together with its own substantial body of precedent.

REASONS FOR DENYING THE PETITION

The Question Presented by State Street Is Hypothetical and Was Not Determinative of the Federal Circuit's Decision

State Street's entire argument for certiorari is based upon a flawed reading of the Federal Circuit's decision. State Street's arguments all incorrectly presume that the Federal Circuit held that the computer application of a

[4] It should be noted that Judge Rich was the co-author of the Patent Act of 1952.

mathematical algorithm to produce a useful result, without more, satisfies the requirements of § 101. Because this fundamental premise is inaccurate, the petition for writ of certiorari should be denied.

The Federal Circuit's holding itself is crystal clear. First, the Federal Circuit held that when the claims of the '056 Patent are properly construed, they are directed to a new "machine" and not a "process." *State Street*, 149 F. 3d at 1371-72, App. A to Petition at A-5 to A-7. Next, the Federal Circuit explained why this particular new machine is patentable subject matter under § 101.

> Today, we hold that the transformation of data, representing discrete dollar amounts *by a machine* through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result" – a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.

149 F.3d at 1373, App. A to Petition at A-10 (emphasis added).

The Federal Circuit's holding is specific and remarkably non-controversial: the application of an algorithm – the executing software interacting with a general purpose computer – as part of a new and useful machine – the data processing system – capable of administrating a particular financial services configuration, is patentable subject matter. Rather than challenge the specific holding, State Street distorts selected dicta to create an issue that

was not before the Federal Circuit. Consequently, the question posed by State Street is solely an academic question and granting the writ would bring before this Court a hypothetical issue that the Federal Circuit did not decide.

The Federal Circuit's Decision Properly Applied the Statute and This Court's Holdings

The Federal Circuit properly concluded that a new and useful machine that solves a practical problem by producing a concrete and tangible result is patentable subject matter under § 101. The Federal Circuit correctly distinguished abstract scientific principles that are not patentable – a mathematical formula standing alone – from claims that apply a scientific principle or algorithm to otherwise statutory subject matter to produce a new and useful result – a new machine capable of administering a financial services configuration. The Federal Circuit's decision was instructed by the language of the statute and this Court's decisions.

As this Court has explained, an analysis of patentable subject matter begins with the statute. *Diamond v. Diehr*, 450 U.S. 175, 182 (1981). Section 101 reads:

> Whoever invents or discovers any new and useful process, machine, manufacture or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. § 101. This Court noted that the statute contained a simple, concise legislative mandate that a patent

may issue for "any new and useful process, machine, manufacture or composition of matter." *Diehr*, 450 U.S. at 182.

Noting the broad nature of the statute, this Court observed that Congress intended § 101 to include "anything under the sun that is made by man." *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (*quoting* S. Rep. No. 1979, 82d Cong., 2d Sess., 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess., 6 (1952)). This Court further recognized that, by casting statutory subject matter in broad terms, Congress was fulfilling its duty under the United States Constitution. *Chakrabarty*, 447 U.S. at 315 ("The subject-matter provisions of the patent law have been cast in broad terms to *fulfill the constitutional* and statutory *goal of promoting 'the Progress of Science and the useful Arts'* with all that means for the social and economic benefits envisioned by Jefferson.") (*quoting* U.S. Const. Art. I, § 8, cl. 8.) (emphasis added). In recognition of these principles, the Federal Circuit explicitly reiterated this Court's warning in construing § 101: "Thus, it is improper to read limitations into § 101 on the subject matter that may be patented where the legislative history indicates that Congress clearly did not intend such limitations." *State Street*, 149 F.3d at 1373, App. A to Petition at A-8 to A-9; *see also Diehr*, 450 U.S. at 182 ("[I]n dealing with the patent laws, we have more than once cautioned that 'courts should not read into the patent laws limitations and conditions which the legislature has not expressed.' ").

State Street's entire argument violates these fundamental tenets. State Street does not challenge the Federal Circuit's finding that the claims of the '056 Patent are directed to a new and useful machine that produces a

concrete and tangible result. Rather, State Street contends that this particular new and useful machine is not patentable subject matter. In short, if this Court adopts State Street's argument, then the language in the statute – "any new and useful . . . machine" – would not be applied to any new and useful machine. Rather, this Court would be creating a brand new statutory exception not justified by the plain terms of the statute or legislative history.

The Federal Circuit recognized that this Court has identified only three categories "of subject matter that are unpatentable, namely 'laws of nature, natural phenomena, and abstract ideas.' "[5] *State Street*, 149 F.3d at 1373, App. A to Petition at A-9 (*quoting Diehr*, 450 U.S. at 185). This Court explained the rationale behind this narrow limitation:

> "[A] new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not patent his celebrated law that $E=mc^2$, nor could Newton have patented the law of gravity. Such discoveries are manifestations of . . . nature, free to all men and reserved exclusively to none."

Diehr, 450 U.S. at 185 (*quoting Chakrabarty*, 447 U.S. at 309.)

---

[5] State Street emphasizes this Court's holdings in *Parker v. Flook*, 437 U.S. 584 (1978) and *Gottschalk v. Benson*, 409 U.S. 63 (1972). But in *Diehr*, this Court explained that those decisions "stand for no more than these long-established principles" that abstract ideas and natural phenomena are not patentable. *Diehr*, 450 U.S. at 185 (*citing Chakrabarty*, 447 U.S. at 309 and *Funk Bros. Seed & Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948)).

In applying that rationale to mathematical algorithms, this Court recognized that a mathematical formula may describe a law of nature, a scientific truth or an abstract idea. Importantly, this Court also recognized that mathematics may be used to describe steps of a statutory method or elements of a statutory machine. *Id.* at 188; *see also Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1056, 22 USPQ 2d 1033, 1035 (Fed. Cir. 1993). The crucial distinction, properly recognized and applied by Judge Rich below, is whether each claim, when viewed as a whole, recites a mathematical formula either in the abstract or as part of an invention, such as a machine, within § 101. *Id.* at 192; *see also In re Alappat*, 33 F.3d at 1545, 31 USPQ 2d at 1558 ("a computer . . . is apparatus, not mathematics.").

Measuring the claims of the '056 Patent against the plain text of § 101 and the fundamental principles in *Diehr* and *Chakrabarty*, the Federal Circuit concluded that the claims are directed to patentable subject matter. In reaching its conclusion, the Federal Circuit recognized the crucial distinction between abstract science that is not patentable subject matter – pure mathematics – and applied science to achieve a particular, useful result – programming a computer to create a new machine to solve a particular problem. *State Street*, 149 F.3d at 1373-74, App. A to Petition at A-9 to A-10.

State Street attempts to avoid this distinction by improperly focusing solely on the part of the claim that can be expressed as an algorithm while ignoring other parts of the claim – such as the "computer processor means" and the "storage means" – that clearly define apparatus to implement a specific functionality. State

Street's approach was rejected by this Court in *Diehr*: "It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the [§ 101] analysis." 450 U.S. at 188. As the Federal Circuit correctly observed, the focus in any statutory subject matter analysis must be on the "claim as a whole." *Diehr*, 450 U.S. at 192; *Alappat*, 33 F.3d at 1543, 31 USPQ 2d at 1557. When the claims of the '056 Patent are viewed as a whole, they are clearly directed to a new and useful machine capable of solving a practical problem by producing a tangible and concrete result. According to the plain terms of the statute and this Court's teachings, such claims are statutory.

The Federal Circuit also examined its own substantial body of established precedent to reach the result below. Specifically, the Federal Circuit examined its precedent since *Diehr* in 1981 and applied the holdings and logic in those cases to the technology and claims involved in the '056 Patent.[6] *State Street*, 149 F.3d at 1373-75, App. A to Petition at A-10 to A-13. That precedent clearly confirmed that claims directed to an admittedly new and useful machine capable of producing a concrete and tangible result to solve a practical problem meet the requirements of § 101.

---

[6] The decisions analyzed included, *inter alia*, *In re Alappat*, 33 F.3d 1526, 31 USPQ 2d 1545 (Fed. Cir. 1994) (*en banc*); *In re Warmerdam*, 33 F.3d 1354, 31 USPQ 2d 1754 (Fed. Cir. 1994); *Arrhythmia Research Technology Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992); and *In re Iwahashi*, 888 F.2d 1370, 12 USPQ 2d 1908 (Fed. Cir. 1989).

State Street also makes passing reference to the so-called "business method exception" as a basis for its conclusion that the claims are not directed to statutory subject matter. Petition at p. 5. The Federal Circuit, however, correctly took the "opportunity to put this ill-conceived exception to rest." *State Street*, 149 F.3d at 1375, App. A to Petition at A-13. Judge Rich noted that the business method exception "has never been invoked by [the Federal Circuit], or the CCPA, to deem an invention unpatentable" and that the U.S. Patent and Trademark Office Guidelines specifically reject use of the exception. 149 F.3d at 1375-77, App. A to Petition at A-14 to A-17 (*citing* Examination Guidelines, 61 Fed. Reg. 7478, 7479 (1996)).

State Street's "Impact Statement" Directly Contradicts the Policies of the Patent Act

State Street argues that it would be "unwise and unfair to now subject to the burdens of the patent system activities that have long been outside its ambit" and that if "such a fundamental change is to be made, it is Congress that should do so."[7] Petition at p. 11. State Street

---

[7] State Street's inference that the Federal Circuit's decision is a drastic, unwanted change in the industry is refuted by the facts. At the time of the decision, there were already over 20,000 financial-instrument patents that had issued. *See* Victoria Slind-Flor, *Patents For Financial Programs OK*, the National Law Journal, Aug. 10, 1998, at p. 1, col. 1. Indeed, the ease with which the financial services industry has embraced the patent system is demonstrated by the fact that a unit of State Street recently received a patent for a data processing system that helps select stocks and construct portfolios. *See* Pui-Wing Tam, *What's Next*

has it exactly backwards. Congress has already provided in § 101 that "any new and useful . . . machine" is patentable. As this Court has recognized, it would be inappropriate for the Court to entertain argument regarding whether it would be "unwise and unfair" to limit otherwise statutory subject matter on policy grounds:

> The choice we are urged to make is a matter of high policy for resolution within the legislative process after the kind of investigation, examination, and study that legislative bodies can provide and courts cannot. That process involves the balancing of competing values and interests, which in our democratic system is the business of elected representatives. Whatever their validity, the contentions now pressed on us should be addressed to the political branches of the Government, the Congress and the Executive, and not to the courts.

Chakrabarty, 447 U.S. at 317.

A computer is a well-known piece of apparatus that is patentable under § 101 just like any other tool or machine. When that machine is programmed to perform a particular useful function that produces a concrete and tangible result, it becomes a new and useful machine. *See Alappat*, 33 F.3d at 1545, USPQ 2d at 1557. State Street, unable to avoid this logical conclusion, attacks the patent system itself and diverts the analysis to theoretical dangers of patent protection in the financial services industry. In short, State Street argues that the financial services industry is somehow different from all other industries

---

Getting Patents For Cold Calls, Wall Street Journal, Nov. 2, 1998, at C1, col. 1.

and should be sheltered from imagined harm caused by allowing inventors in this industry to obtain patents. This argument concludes that no innovation, no matter how novel, unique, unobvious and useful, warrants patent protection if it affects the financial services industry.

This conclusion, however, would directly undermine the policy behind the Patent Act. As explained by the Federal Circuit, the incentives offered by patent protection have served this country well as an engine for fostering innovation:

> Law and public policy intertwine in embracing new fields in the scope of section 101. Patent law has nicely fostered technological advance in the United States, for its principles are particularly suited to a free market system: it requires neither governmental intrusion nor federal funds to provide the incentive for industrial innovation; the innovation incentive is the direct consequence of the patent grant. I know of no major technological advance, no new industry or evolving technology, that has not participated in the patent system. It is estimated that 85-90% of the world's technology is disclosed only in patent documents. Justice Story's words at the threshold of our nation's industrialization have been reinforced by experience:
>
> > Patents for inventions are now treated as a just reward to ingenious men, and as highly beneficial to the public, not only by holding out suitable encouragement to genius and talents and enterprise; but as ultimately securing to the whole community great advantages from the free communication of secrets, and processes, and machinery, which may be most important to all the

> great interests of society, to agriculture, to commerce and to manufactures, as well as to the cause of science and art.

Alappat, 33 F.3d at 1570-71, 31 USPQ 2d at 1579 (*quoting Blanchard v. Sprague*, 3 F.Cas. 648, 650 (C.C.D. Mass. 1839)). The Federal Circuit's decision is squarely in line with public policy.

State Street's argument that Congress should act to extend patent protection to computer-implemented inventions in the financial services industry is invalid. Congress has purposely acted by choosing the broad language of § 101. This Court should not read limitations into the statute where none are present or intended. *Chakrabarty*, 447 U.S. at 308. Indeed, if an entire industry or technology is to be carved out of § 101, it is Congress that must do so. *Id.* at 317.

Finally, State Street's contention that the practical consequences of the decision "are of an unprecedently broad scope" is a litigant's exaggeration. Petition at p. 6. The Federal Circuit's decision addressed only the narrow issue of patentable subject matter under § 101. Section 101 is merely " '[t]he first door which must be opened on the difficult path to patentability[.]' " *State Street*, 149 F.3d at 1372 & n. 2, App. A to Petition at A-8 & n. 2. (*quoting In re Bergy*, 597 F.2d 952, 960, 201 USPQ 352, 360 (CCPA 1979)). Of course, to secure a patent, the claimed invention must also meet the other requirements of Title 35, including §§ 102 (novelty), 103 (nonobviousness) and 112, ¶¶ 1 and 2 (enablement and particularity). These provisions are more than adequate to guard against the theoretical dangers raised by State Street.

CONCLUSION

For the foregoing reasons, the petition for a writ of certiorari should be denied.

Respectfully submitted,

STEVEN L. FRIEDMAN
Counsel of Record
THOMAS S. BIEMER
DILWORTH PAXSON LLP

STEVEN J. HENRY
WOLF, GREENFIELD & SACKS, P.C.